SHEET NO.	TOTAL SHEETS
1	12

CITY OF WICHITA, KANSAS

MICHAEL E. LINDEBAK, P.E., CITY ENGINEER

INTERSECTION IMPROVEMENTS AT WOODLAWN AND ROCKHILL LANE

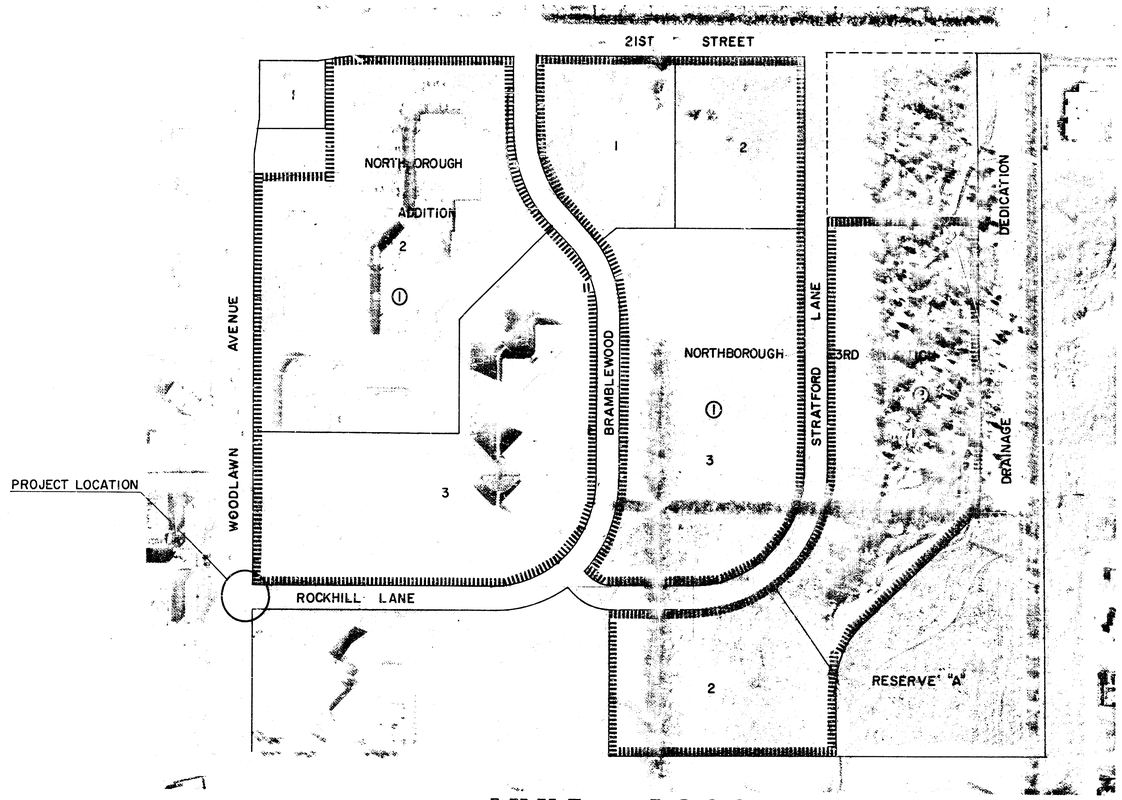
CITY OF WICHITA PROJECT NO. 472-76-245-81644-000-000-001 **INDEX #606582**

INDEX OF SHEETS

1 Title Sheet
2 Traffic Signal Plan
3 Traffic Signal Summary
4-7 Traffic Signal Details
8-12 Traffic Signal Specifications

GENERAL NOTES

1. TRAFFIC IS TO BE CARRIED THROUGH CONSTRUCTION AT ALL TIMES.
2. UTILITY SERVICE LINES, POLES, VALVE BOXES, METERS, AND ETCEVERA ARE TO BE ADJUSTED AS NECESSARY BY OTHERS PRIOR TO CONSTRUCTION UNLESS THE PLANS SPECIFICALLY CALL FOR THEIR ADJUSTMENT BY THE CONTRACTOR OR UNLESS THE PLANS SPECIFICALLY IDENTIFY A UTILITY TO BE ADJUSTED BY ITS OWNER DURING CONSTRUCTION. EXISTING UTILITIES AND THEIR LOCATION, AS SHOWN ON THE PLANS, REPRESENT THE BEST INFORMATION OBTAINABLE FOR DESIGN. THE CONTRACTOR WILL BE REQUIRED TO WORK AROUND EXISTING UTILITIES WITHIN THE RIGHT-OF-WAY WHICH DO NOT CONFLICT WITH PROPOSED CONSTRUCTION.
3. RUBBLE FROM THE REMOVAL OF MISCELLANEOUS STRUCTURES AND EXCESS EXCAVATION WHICH IS TO BE WASTED SHALL BE DISPOSED OF ON SITES TO BE PROVIDED BY THE CONTRACTOR. THESE SITES SHALL BE APPROVED BY THE ENGINEER AS TO SUITABILITY, APPEARANCE AND SITE LOCATION. LOCATIONS THAT, IN THE OPINION OF THE ENGINEER, WILL LEAVE AN UNSIGHTLY APPEARANCE WILL NOT BE APPROVED.
4. PROPERTIES WITHIN THE PROJECT LIMITS MAY HAVE UNDERGROUND SPRINKLER SYSTEMS IN PUBLIC RIGHT-OF-WAY WHICH CONFLICT WITH NEW CONSTRUCTION. THE CONTRACTOR WILL BE REQUIRED TO ADJUST AND/OR REPAIR THE SPRINKLER SYSTEM TO ITS PRECONSTRUCTION CONDITION. PORTIONS OF UNDERGROUND SPRINKLER SYSTEMS NOT IN CONFLICT WITH NEW CONSTRUCTION SHALL BE PROTECTED FROM DAMAGE AND SHALL REMAIN IN PLACE. ALL WORK IN CONNECTION WITH UNDERGROUND SPRINKLER SYSTEMS SHALL BE CONSIDERED AS SUBSIDIARY TO THE CONTRACT PAY ITEMS OF WORK.
5. THE LUMP SUM PRICE PAID FOR "TRAFFIC SIGNAL INSTALLATION SHALL BE CONSIDERED FULL COMPENSATIGN FOR ALL LABOR, TOOLS, MATERIALS, EQUIPMENT, AND INCIDENTALS NECESSARY FOR THE COMPLETE INSTALLATION AND SATISFACTORY OPERATION OF THE PROPOSED TRAFFIC SIGNAL.
6. EXISTING TURFED AREAS, DISTURBED BY CONSTRUCTION, SHALL BE RESTORED BY SODDING. THIS WORK SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THE LUMP SUM BID ITEM "TRAFFIC SIGNAL INSTALLATION".
7. *The Traffic Signal turn on shall be made only from Tuesday thru Thursday between the hours of 9:00am and 3:00 p.m.*



SCALE: 1" = 200'

LEGEND

IMPROVEMENT DISTRICT

BRENT E. REEVES LICENSED 8188 KANSAS PROFESSIONAL ENGINEER

JUNE, 1988

PLANS PREPARED BY

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

ENGINEERS

WICHITA, KANSAS

PROJECT NO	SHEET NO	TOTAL SHEETS
472-76-245-81G44-000-000-001	2	12

LOOP DETECTOR SUMMARY

LOOP NO.	SIZE	NO. OF TURNS	PHASE CALLED	DETECTOR NO.
1	6x6	4	4	4IGU
2	6x6	4	4	4IGU
3	6x6	4	4	4IGL
4	6x6	4	4	4IGL
5	6x6	4	8	8IGU
6	6x6	4	8	8IGU
7	6x6	4	8	8IGL
8	6x6	4	8	8IGL
9	6x25	3	6	6I2U
10	6x10	4	6	6I2L
11	6x14	4	2	2I2U

Detector 10 & 11 shall have a 10 sec. delay

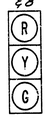
CONTROLLER PROGRAM TABLE F

	1	2	3	4	5	6	7	8
0 WALK	—	7.0	—	7.0	—	7.0	—	7.0
1 DON'T WALK	—	12.0	—	14.3	—	17.1	—	6.3
2 MIN. GREEN	—	5.0	—	5.0	—	5.0	—	5.0
3 T.3. DETECTOR	—	0	—	0	—	0	—	0
4 ADD INIT.	—	2.0	—	2.0	—	2.0	—	2.0
5 EXT.	—	2.0	—	2.0	—	2.0	—	2.0
6 MAX. GAP	—	1.0	—	2.0	—	1.0	—	2.0
7 MIN. GAP	—	1.0	—	2.0	—	1.0	—	2.0
8 MAX. GREEN I	—	20.0	—	30.0	—	20.0	—	30.0
9 MAX. GREEN II	—	—	—	—	—	—	—	—
a SPARE	—	—	—	—	—	—	—	—
b SPARE	—	—	—	—	—	—	—	—
c GR. STEP	—	0.5	—	0	—	0.5	—	0
d REDU. EVERY	—	1.0	—	0	—	1.0	—	0
e YELLOW	—	3.5	—	3.2	—	3.5	—	3.2
f ALL RED	—	1.0	—	1.0	—	1.0	—	1.0

F+F TABLE

	1	2	3	4	5	6	7	8
0 PERMIT	—	X	—	X	—	X	—	X
1 RED LOCK	—	—	—	—	—	—	—	—
2 YELLOW LOCK	—	—	—	X	—	—	—	X
3 VEH. RECALL	—	—	—	X	—	—	—	X
4 PED. RECALL	—	—	—	—	—	—	—	—
5 PED. PHASE	—	X	—	X	—	X	—	X
6 OVERLAP A	—	—	—	—	—	—	—	—
7 OVERLAP B	—	—	—	—	—	—	—	—
8 DOUBLE ENTRY	—	—	—	X	—	—	—	X
9 MAX. II	—	—	—	—	—	—	—	—
a LAG PHASE	—	—	—	—	—	—	—	—
b RED REST	—	—	—	—	—	—	—	—
c NON-ACT	—	—	—	—	—	—	—	—
d MAX. II DAY	—	—	—	—	—	—	—	—
e START UP	—	—	—	—	—	—	—	—
f KEY	—	—	—	—	—	—	—	—

2,4,G, & 8

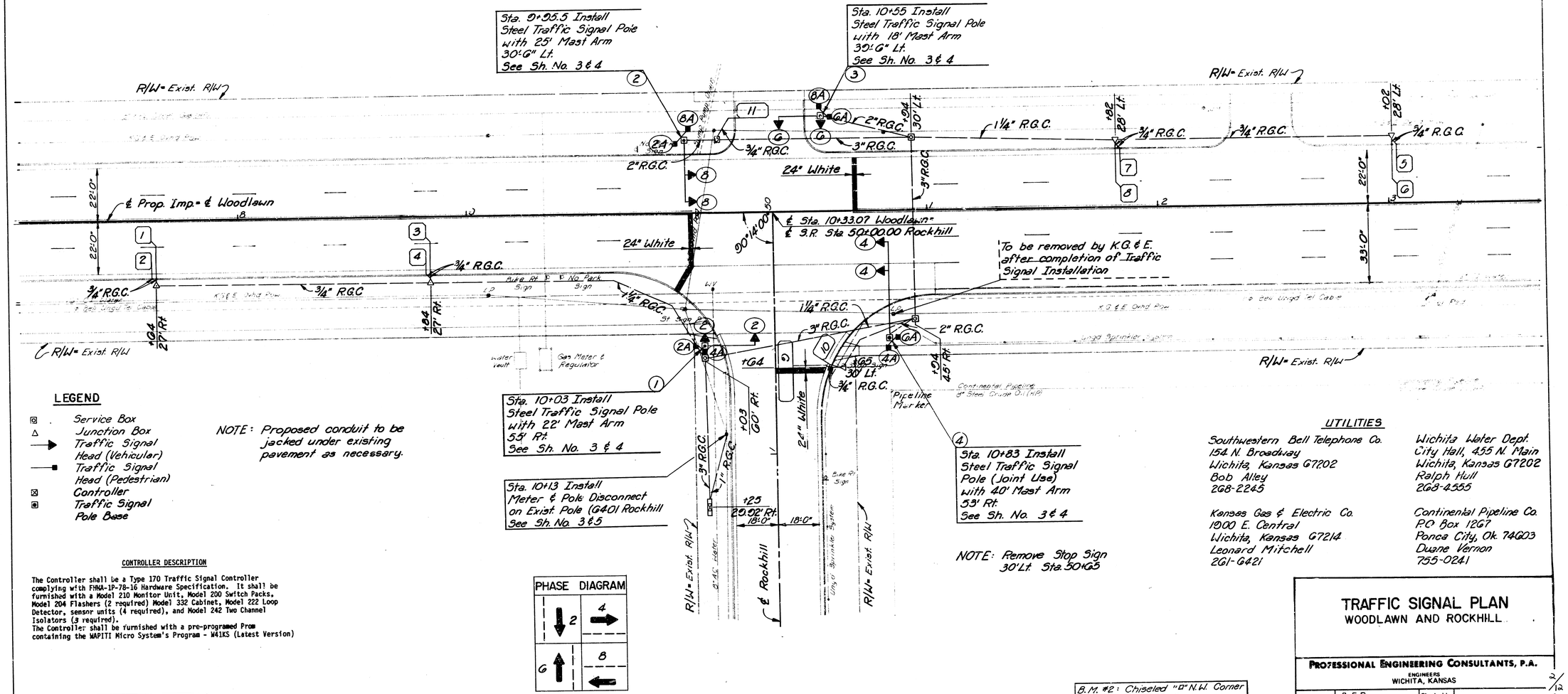


2A,4A, GA & 8A

SIGNAL HEADS

PSE

Scale : 1"=20'-0"



LEGEND

- Service Box
- Junction Box
- Traffic Signal Head (Vehicular)
- Traffic Signal Head (Pedestrian)
- Controller
- Traffic Signal Pole Base

NOTE: Proposed conduit to be jacked under existing pavement as necessary.

Sta. 10+03 Install Steel Traffic Signal Pole with 22' Mast Arm 55' Rt. See Sh. No. 3 & 4

Sta. 10+13 Install Meter & Pole Disconnect on Exist. Pole (G40) Rockhill See Sh. No. 3 & 5

Sta. 10+83 Install Steel Traffic Signal Pole (Joint Use) with 40' Mast Arm 53' Rt. See Sh. No. 3 & 4

NOTE: Remove Stop Sign 30' Lt. Sta. 50+05

UTILITIES

Southwestern Bell Telephone Co.
154 N. Broadway
Wichita, Kansas 67202
Bob Alley
268-2245

Kansas Gas & Electric Co.
1900 E. Central
Wichita, Kansas 67214
Leonard Mitchell
261-6421

Wichita Water Dept.
City Hall, 455 N. Main
Wichita, Kansas 67202
Ralph Hull
268-4555

Continental Pipeline Co.
P.O. Box 1267
Ponca City, Ok. 74603
Duane Vernon
755-0241

CONTROLLER DESCRIPTION

The Controller shall be a Type 170 Traffic Signal Controller complying with FHWA-IP-78-16 Hardware Specification. It shall be furnished with a Model 210 Monitor Unit, Model 200 Switch Packs, Model 204 Flashers (2 required) Model 332 Cabinet, Model 222 Loop Detector, sensor units (4 required), and Model 242 Two Channel Isolators (3 required).
The Controller shall be furnished with a pre-programed Prom containing the WAPITI Micro System's Program - W41KS (Latest Version)

PHASE DIAGRAM

B.M. #1: Chiseled "□" on N.W. Corner of N. End of W. Curb 24.5' Lt. @ Sta. 10+00.00 Elev. 218.20

B.M. #2: Chiseled "□" N.W. Corner of W. End of N. Curb 60.3' Rt. Sta. 17+68.7 Elev. 212.01

TRAFFIC SIGNAL PLAN
WOODLAWN AND ROCKHILL

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
ENGINEERS
WICHITA, KANSAS

Designed by	B.E.R.	Checked by		
Drawn by	V.J.K.	Date	June, 1988	Job No. 87413

2/12

PROJECT NO.	SHEET NO.	TOTAL SHEETS
472-76-245-81G44-000-000-001	3	12

WIRING NOTES

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL LOOP WIRE, SHIELDED LOOP LEAD-IN WIRE, POWER SUPPLY CABLE, AND TRAFFIC SIGNAL CABLE FOR THE COMPLETE OPERATION OF THE TRAFFIC SIGNAL.

ONE, SEVEN CONDUCTOR CABLE SHALL BE RUN FROM THE CONTROLLER TO EACH TRAFFIC SIGNAL POLE FOR PEDESTRIAN MOVEMENTS. THE FOLLOWING COLOR CODE SHALL BE USED:

COLOR	USE
BLACK	PUSH BUTTON (PHASE 4 OR 8)
WHITE	COMMON (SIGNAL)
RED	DON'T WALK
GREEN	WALK
ORANGE	PUSH BUTTON (PHASE 2 OR 6)
BLUE	WALK
WHITE W/BLACK TRACER	DON'T WALK

EACH THREE SECTION SIGNAL HEAD SHALL HAVE ONE CONTINUOUS RUN OF 5 CONDUCTOR CABLE FROM THE POLE BASE TO THE TERMINAL BLOCK WITHIN THE HEAD. THE FOLLOWING COLOR CODE SHALL BE USED.

COLOR	USE
BLACK	SPARE
WHITE	COMMON
RED	RED
GREEN	GREEN
ORANGE	YELLOW

EACH PEDESTRIAN SIGNAL HEAD SHALL HAVE ONE CONTINUOUS RUN OF A 5 CONDUCTOR CABLE FROM THE POLE BASE TO THE TERMINAL BLOCK WITHIN THE HEAD. THE FOLLOWING COLOR CODE SHALL BE USED.

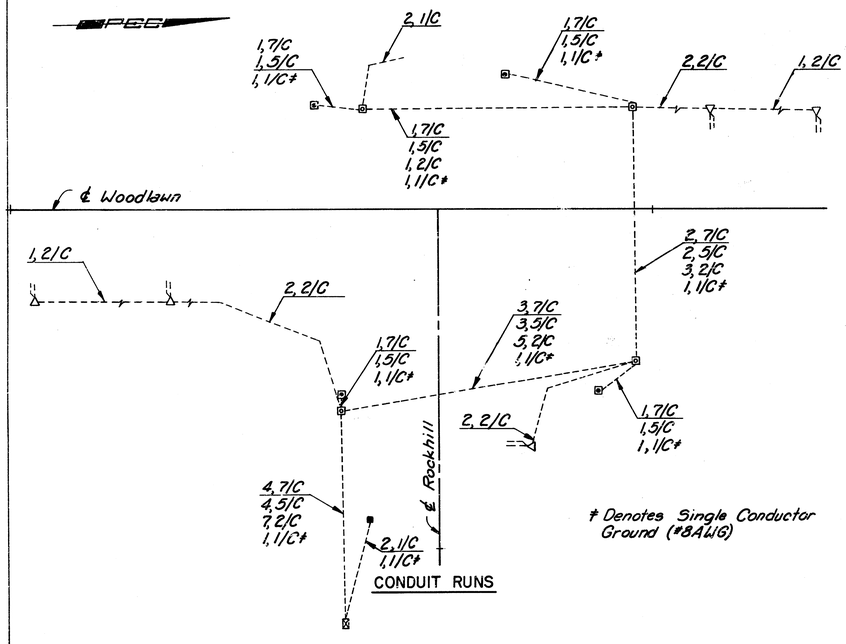
COLOR	USE
BLACK	WALK (PHASE 4 AND 8)
WHITE	COMMON
RED	DON'T WALK (PHASE 2 AND 6)
GREEN	WALK (PHASE 2 AND 6)
ORANGE	DON'T WALK (PHASE 4 AND 8)

EACH PEDESTRIAN PUSH BUTTON SHALL HAVE ONE CONTINUOUS RUN OF 2 CONDUCTOR CABLE FROM THE BASE OF THE SIGNAL POLE TO THE PUSH BUTTON. THE FOLLOWING COLOR CODE SHALL BE USED:

COLOR	USE
BLACK	PUSH BUTTON
WHITE	COMMON

IDENTIFY CABLE RUNS IN CABINET.

A SINGLE CONDUCTOR STRANDED #8 GREEN WIRE SHALL CARRY THE EQUIPMENT GROUND FROM THE GROUNDING LUG OF ALL SIGNAL POLES TO THE CONTROLLER CABINET AND THE POWER DISCONNECT BOX.



* Denotes Single Conductor Ground (#8AWG)

TRAFFIC SIGNAL POLE SUMMARY

POLE NO.	STATION	OFFSET	TYPE ①	LENGTH	NO. OF SIGNALS ON ARM	BRACKET TYPE	X	X_1	NO. OF SIGNALS ON POLE	BRACKET TYPE	NO. OF PUSH BUTTONS ON POLE	REMARKS
1	10+03	55' Rt.	A	22	1	I	—	—	3	III	2	
2	9+55.5	30.5' Lt.	A	25	2	I	II	—	2	II	2	
3	10+55	30.5' Lt.	A	18	1	I	—	—	3	III	2	
4	10+83	53' Rt.	B	40	2	I	II	—	2	II	2	

① A- Steel pole with Mast Arm
B- Steel pole (Joint Use) with Mast Arm

SUMMARY OF TRAFFIC SIGNAL HEADS

NUMBER	TYPE	SIZE	BRACKET TYPE	QUANTITY
2	A	3@12"	I/III	2
2A	L	2@9"	II	2
4	A	3@12"	I	2
4A	L	2@9"	II	2
6	A	3@12"	I/III	2
6A	L	2@9"	II	2
8	A	3@12"	I	2
8A	L	2@9"	II	2

SUMMARY OF SERVICE & JUNCTION BOXES

STATION	OFFSET	SERVICE BOX	JUNCTION BOX
10+03	60' Rt.	X	
10+10	30' Lt.	X	
10+94	45' Rt.	X	
10+94	30' Lt.	X	
7+64	27' Rt.		X
8+84	27' Rt.		X
11+82	28' Lt.		X
13+02	28' Lt.		X
Rockhill			
50+65	30' Lt.		X
Totals		4	5

SUMMARY OF CONDUITS

LOCATION				SIZE	QUANTITY (L.F.)
STATION	OFFSET	STATION	OFFSET		
7+64	27' Rt.	(Loop Lead)		3/4"	5'
7+64	27' Rt.	8+84	27' Rt.	3/4"	120'
8+84	27' Rt.	(Loop Lead)		3/4"	5'
8+84	27' Rt.	10+03	60' Rt.	1 1/4"	138'
10+03	60' Rt.	10+03	55' Rt.	2"	5'
10+03	60' Rt.	51+25	29.02' Rt.	3"	67'
10+13	52' Rt.	51+25	29.02' Rt.	1"	35'
10+03	60' Rt.	10+94	45' Rt.	3"	93'
10+94	45' Rt.	10+83	53' Rt.	2"	14'
10+94	45' Rt.	10+94	30' Lt.	3"	75'
10+94	45' Rt.	50+65	30' Lt.	1 1/4"	43'
50+65	30' Lt.	(Loop Lead)		3/4"	5'
10+94	30' Lt.	10+55	30.5' Lt.	2"	40'
10+94	30' Lt.	10+10	30' Lt.	3"	84'
10+94	30' Lt.	11+82	28' Lt.	1 1/4"	88'
11+82	28' Lt.	(Loop Lead)		3/4"	5'
11+82	28' Lt.	13+02	28' Lt.	3/4"	120'
13+02	28' Lt.	(Loop Lead)		3/4"	5'
10+10	30' Lt.	9+35.5	30.5' Lt.	2"	15'
10+10	30' Lt.	(Loop Lead)		3/4"	12'

Note: Lengths given are ℄ of pole/box to ℄ pole/box and do not include length for elbows or risers.

BILL OF MATERIALS

ITEM	UNIT	QUANTITY
Controller with Cabinet	Each	1
Concrete Base for Controller	Each	1
Traffic Signal Pole (Type A)	Each	3
Traffic Signal Pole (Type B)	Each	1
Concrete Base for Traffic Signal Pole	Each	4
Traffic Signal Head (Type A)	Each	8
Traffic Signal Head (Type L)	Each	8
Mounting Bracket (Type I)	Each	6
Mounting Bracket (Type II)	Each	4
Mounting Bracket (Type III)	Each	2
Traffic Signal Lamp	Each	40
Ground Rod & Clamp	Each	6
Meter Box	Each	1
Power Disconnect Box (70Amp w/30Amp Breaker)	Each	1
Weather Head	Each	1
Service Box	Each	4
Junction Box	Each	5
1" Conduit (RGC)	Lin. Ft.	35
3" Conduit (RGC)	Lin. Ft.	319
2" Conduit (RGC)	Lin. Ft.	74
1 1/4" Conduit (RGC)	Lin. Ft.	304
3/4" Conduit (RGC)	Lin. Ft.	277
Multi-conductor Cable 7/C #14AWG	Lin. Ft.	1,000
Multi-conductor Cable 5/C #14AWG	Lin. Ft.	1,000
Multi-conductor Cable 3/C #14AWG	Lin. Ft.	—
Multi-conductor Cable 2/C #14AWG	Lin. Ft.	50
Power Supply Wire (Type T.W. Stranded) #8AWG	Lin. Ft.	1,000
Loop Detector Wire (Type THHH) #14AWG	Lin. Ft.	1,700
Shielded Loop Detector Feeder Cable (Beldon #8720) #14AWG	Lin. Ft.	2,500
Pushbutton w/sign	Each	8

RECAPITULATION OF QUANTITIES

ITEM	UNIT	QUANTITY
Traffic Signal Installation	L.S.	Lump Sum

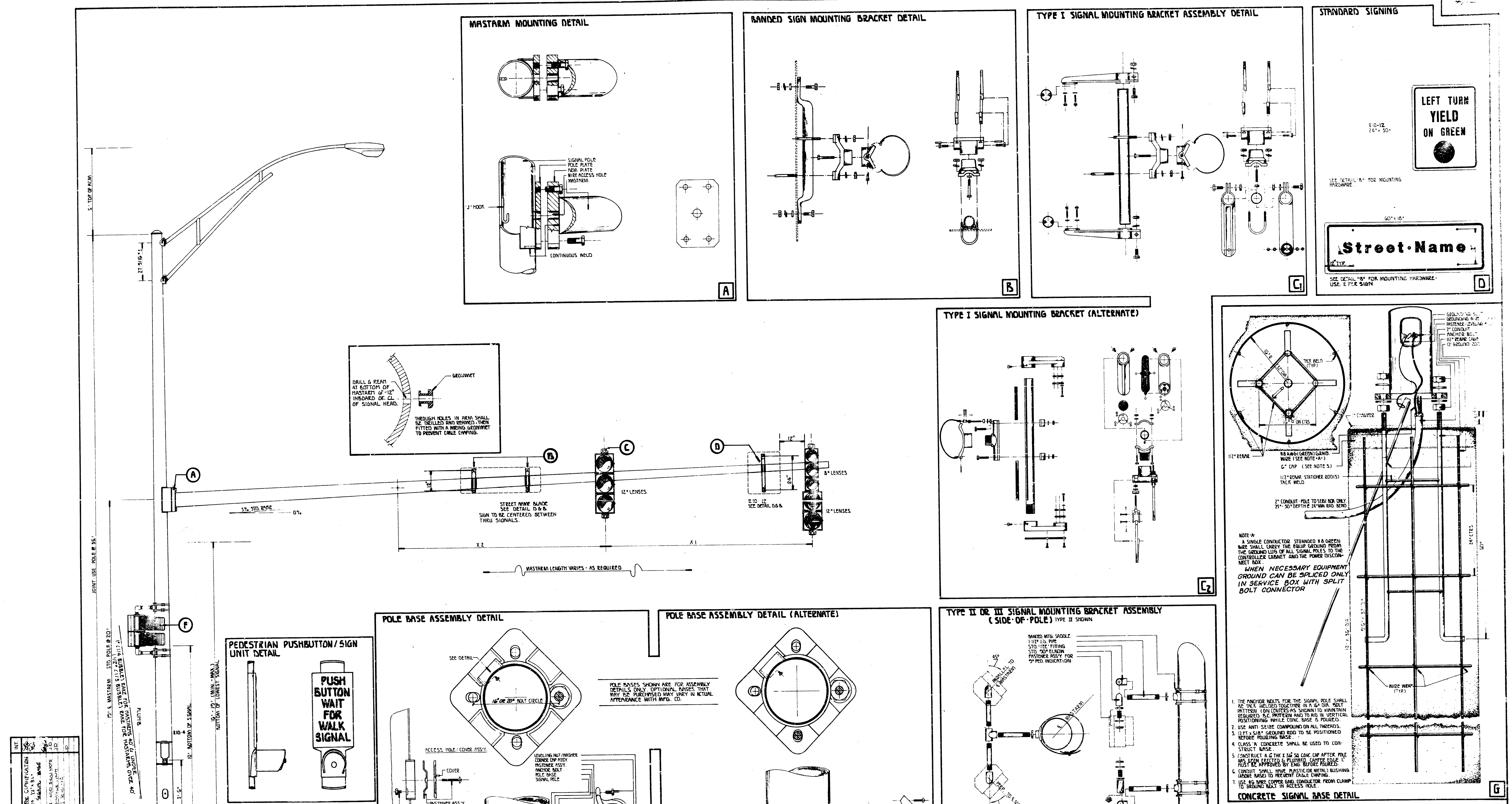
Note: The Contractor shall be responsible to furnish and install all equipment necessary for the complete & satisfactory operation of the traffic signal, whether said equipment is specifically mentioned or not.

TRAFFIC SIGNAL SUMMARY

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
ENGINEERS
WICHITA, KANSAS

3/12

Designed by	BEP	Checked by		
Drawn by	VJK	Date	June, 1988	Job No. 87413



MASTARM MOUNTING DETAIL
A
BANDED SIGN MOUNTING BRACKET DETAIL
B
TYPE I SIGNAL MOUNTING BRACKET ASSEMBLY DETAIL
C
STANDARD SIGNING
LEFT TURN
YIELD
ON GREEN
Street·Name
D
TYPE I SIGNAL MOUNTING BRACKET (ALTERNATE)
MASTARM LENGTH VARIES - AS REQUIRED
PEDESTRIAN PUSHBUTTON / SIGN UNIT DETAIL
PUSH
BUTTON
WAIT
FOR
WALK
SIGNAL
POLE BASE ASSEMBLY DETAIL
E1
POLE BASE ASSEMBLY DETAIL (ALTERNATE)
E2
POLE BASES SHOWN ARE FOR ASSEMBLY DETAILS ONLY. OPTIONAL BASES THAT MAY BE PURCHASED MAY VARY IN ACTUAL APPEARANCE WITH MFG. CO.
TYPE II OR III SIGNAL MOUNTING BRACKET ASSEMBLY
(SIDE-OF-POLE) TYPE II SHOWN
PERP. TO ℄ MASTARM (90°)
45°
1. DIRECTIONAL ALIGNMENT OF PED. INDICATIONS & BRACKET (S) SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
2. THROUGH HOLES IN THE POLE SHALL BE DRILLED AND WELL REAMED TO PREVENT CABLE CHAFING.
3. MOUNTING BRACKET (TYPE III) SHALL CONSIST OF A SIDE-OF-POLE BRACKET CAPABLE OF SUPPORTING ONE, THREE-SECTION TRAFFIC SIGNAL HEAD.
F
WHEN NECESSARY EQUIPMENT GROUND CAN BE SPLICED ONLY IN SERVICE BOX WITH SPLIT BOLT CONNECTOR
1. THE ANCHOR BOLTS FOR THE SIGNAL POLE SHALL BE TACK WELDED TOGETHER IN A 16" DIA. BOLT PATTERN (ON CENTERS AS SHOWN) TO MAINTAIN REQUIRED B.C. PATTERN AND TO AID IN VERTICAL POSITIONING WHILE CONC. BASE IS POURED.
2. USE ANTI-SEIZE COMPOUND ON ALL THREADS.
3. 12 FT x 5/8" GROUND ROD TO BE POSITIONED BEFORE POURING BASE.
4. CLASS 'A' CONCRETE SHALL BE USED TO CONSTRUCT BASE.
5. CONSTRUCT A 6" THK X 36" SQ CONC. CAP AFTER POLE HAS BEEN ERECTED & PLUMBED. CAMFER EDGE 1" MUST BE APPROVED BY ENG. BEFORE POURED.
6. CONDUIT SHALL HAVE PLASTIC (OR METAL) BUSHING (ABOVE BASE) TO PREVENT CABLE CHAFING.
7. USE #6 BARE COPPER GND. CONDUCTOR FROM CLAMP TO GROUND BOLT IN ACCESS HOLE.
CONCRETE SIGNAL BASE DETAIL
G
BASEPLATE DETAIL

PROJECT DESCRIPTION

STEEL SIGNAL POLE ASSEMBLY DETAILS

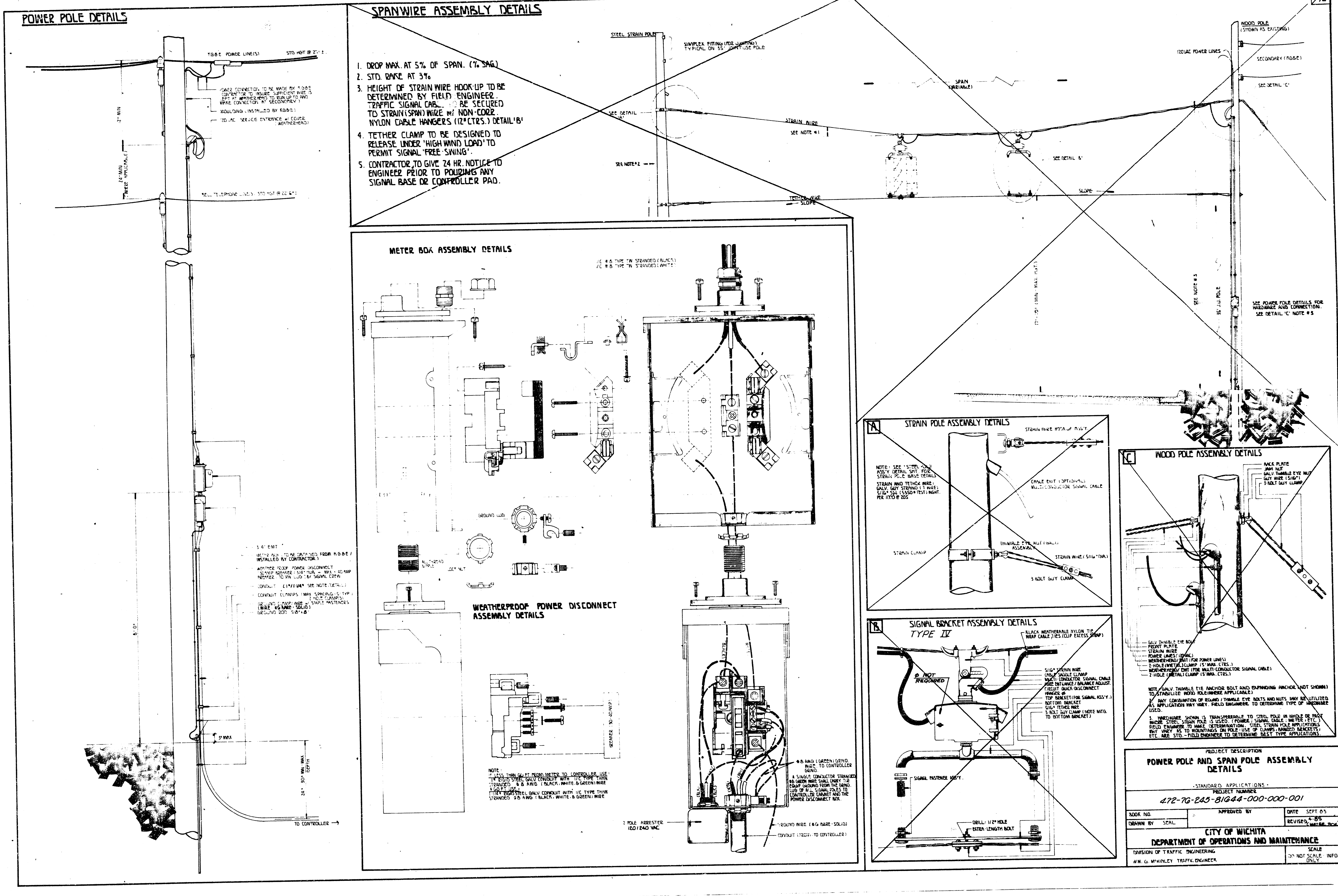
PROJECT NUMBER
472-76-245-81644-000-000-001

BOOK NO.	APPROVED BY	DATE AUG. 83
DRAWN BY SEAL		REVISED

CITY OF WICHITA
DEPARTMENT OF PUBLIC WORKS

DIVISION OF TRAFFIC ENGINEERING
WM. G. McKINLEY: TRAFFIC ENGINEER

SCALE


POWER POLE DETAILS
KG&E POWER LINE(S)
STD HGT @ 25'±
MOULDING (INSTALLED BY KG&E)
TO CONTROLLER
SPANWIRE ASSEMBLY DETAILS
STEEL STRAIN POLE
SPAN (VARIABLE)
STRAIN WIRE
SEE NOTE #1
SEE DETAIL 'B'
SLOPE
TETHER WIRE
SEE NOTE #2
WOOD POLE (SHOWN AS EXISTING)
SECONDARY (KG&E)
SEE DETAIL 'C'
SEE POWER POLE DETAILS FOR HARDWARE AND CONNECTION.
SEE DETAIL 'C' NOTE #3
METER BOX ASSEMBLY DETAILS
GROUND LUG
WEATHERPROOF POWER DISCONNECT ASSEMBLY DETAILS
1 POLE ARRESTER 120/240 VAC
#8 AWG (GREEN) GRND. WIRE TO CONTROLLER GRND.
GROUND WIRE (#6 BARE - SOLID)
CONDUIT (FROM TO CONTROLLER)
A
STRAIN POLE ASSEMBLY DETAILS
STRAIN CLAMP
STRAIN WIRE (5/16" DIA.)
3-BOLT GUY CLAMP
C
WOOD POLE ASSEMBLY DETAILS
B
SIGNAL BRACKET ASSEMBLY DETAILS
TYPE IV
NOT REQUIRED
SIGNAL FASTENER ASS'Y.
DRILL 1/2" HOLE
EXTRA LENGTH BOLT

1. DROP MAX. AT 5% OF SPAN. (% SAG)
2. STD. RAKE AT 3%
3. HEIGHT OF STRAIN WIRE HOOK-UP TO BE DETERMINED BY FIELD ENGINEER. TRAFFIC SIGNAL CABLE TO BE SECURED TO STRAIN (SPAN) WIRE w/ NON-CORR. NYLON CABLE HANGERS (12" CTRS.) DETAIL 'B'
4. TETHER CLAMP TO BE DESIGNED TO RELEASE UNDER 'HIGH WIND LOAD' TO PERMIT SIGNAL 'FREE SWING'.
5. CONTRACTOR TO GIVE 24 HR. NOTICE TO ENGINEER PRIOR TO POURING ANY SIGNAL BASE OR CONTROLLER PAD.

PROJECT DESCRIPTION

POWER POLE AND SPAN POLE ASSEMBLY DETAILS

- STANDARD APPLICATIONS -

PROJECT NUMBER

472-76-245-81G44-000-000-001

BOOK NO.	APPROVED BY	DATE SEPT 85
DRAWN BY SEAL		REVISED

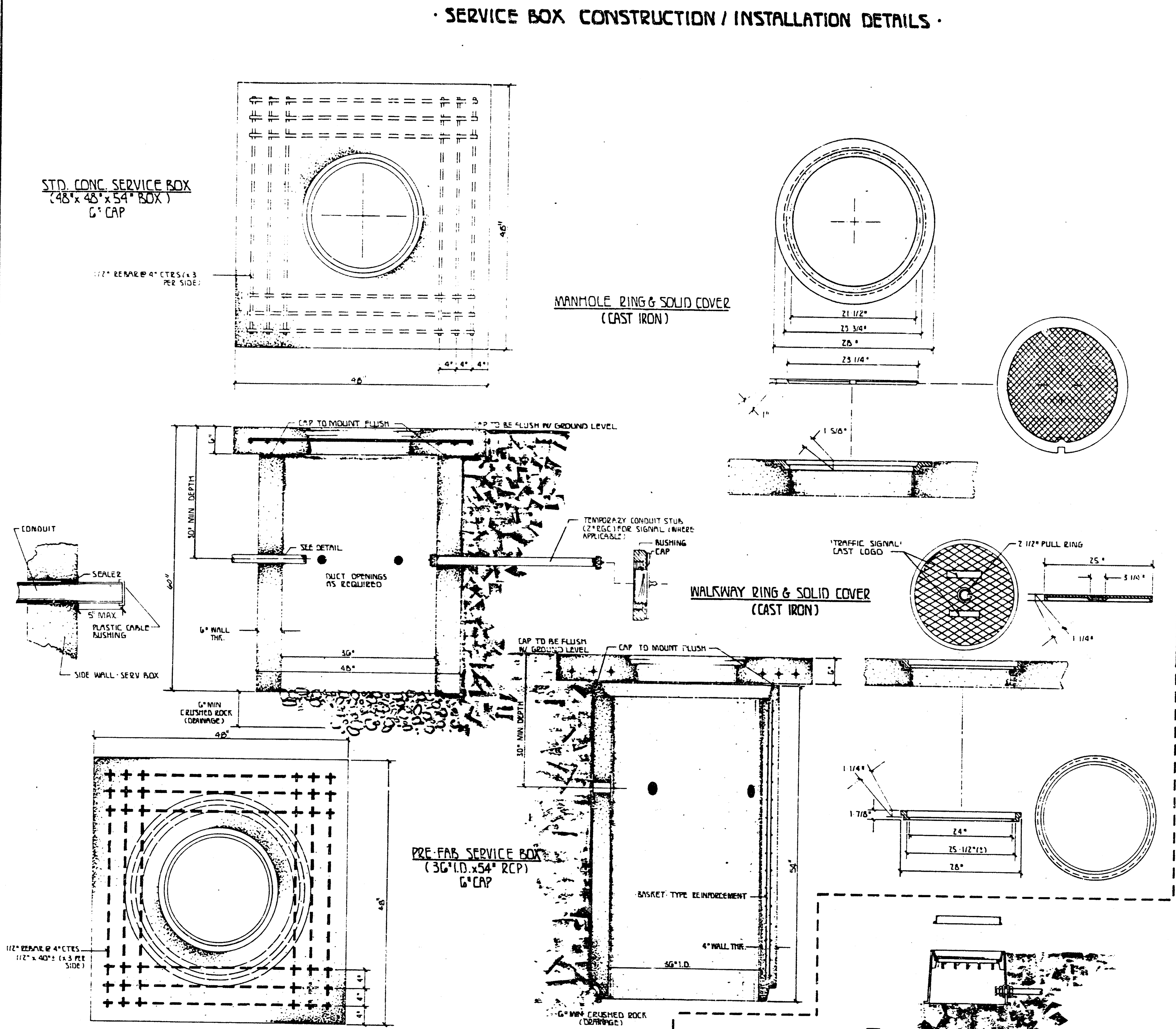
CITY OF WICHITA
DEPARTMENT OF OPERATIONS AND MAINTENANCE

DIVISION OF TRAFFIC ENGINEERING

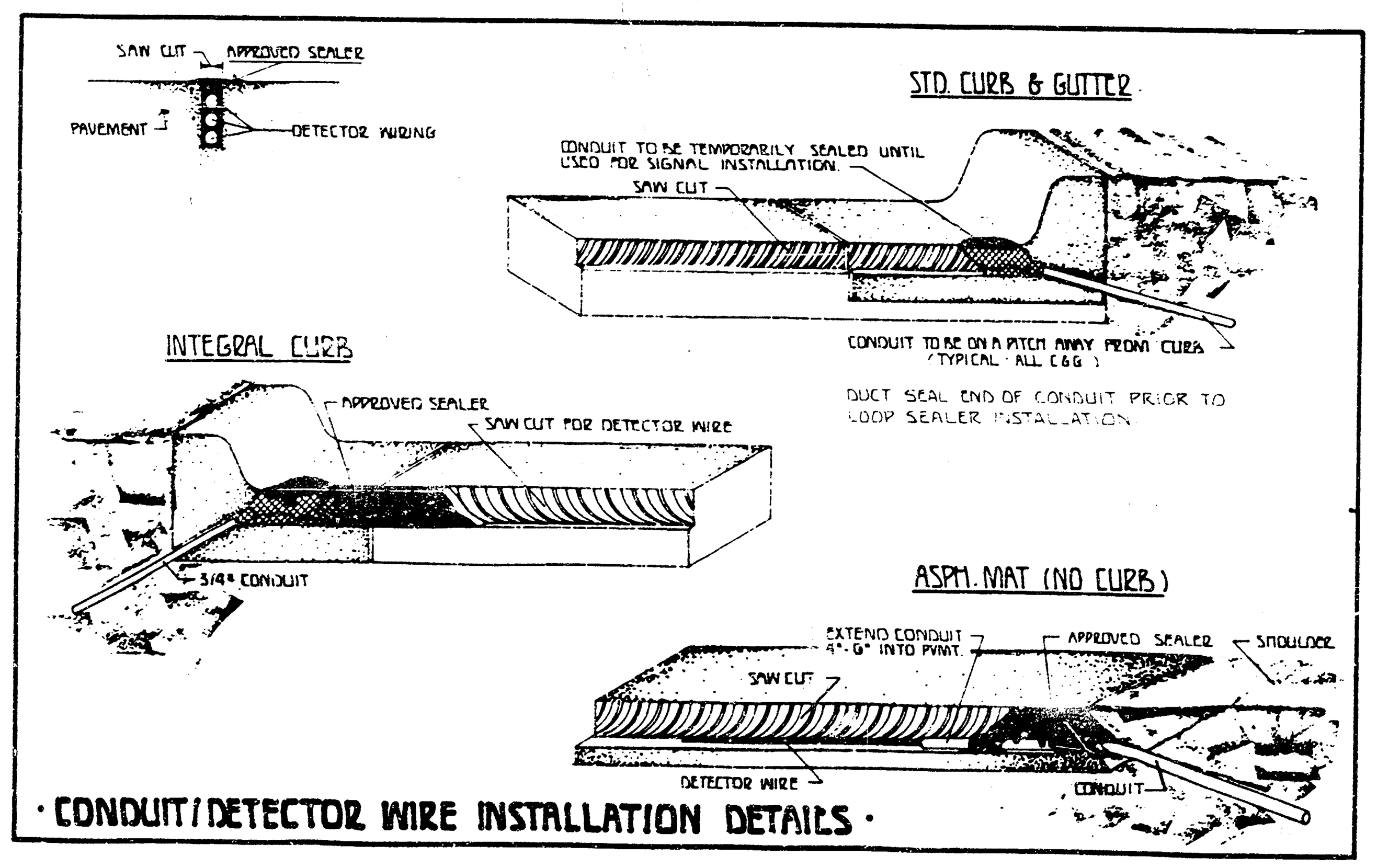
W.M. G. McKINLEY TRAFFIC ENGINEER

SCALE: DO NOT SCALE. INFO ONLY

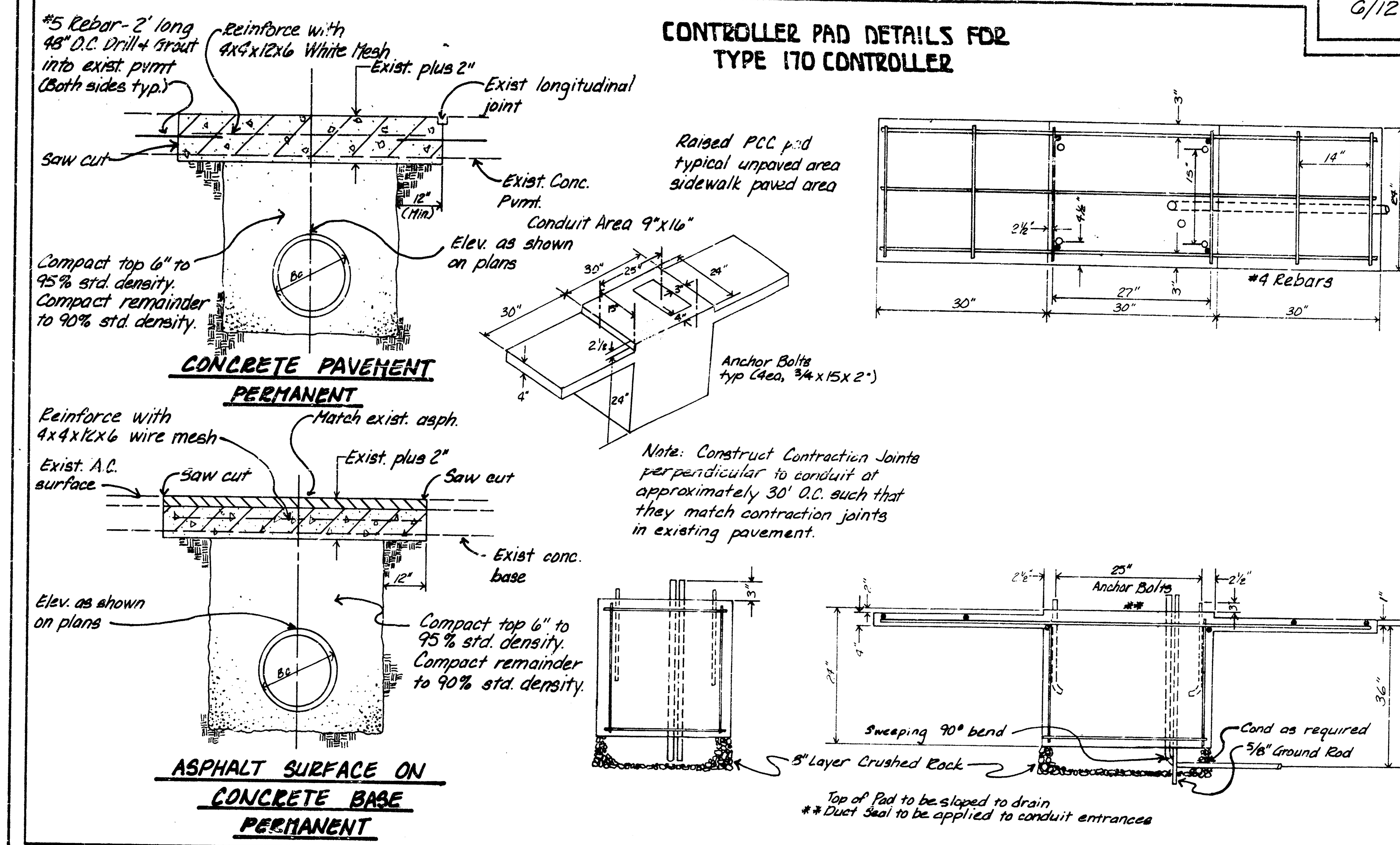
SERVICE BOX CONSTRUCTION / INSTALLATION DETAILS



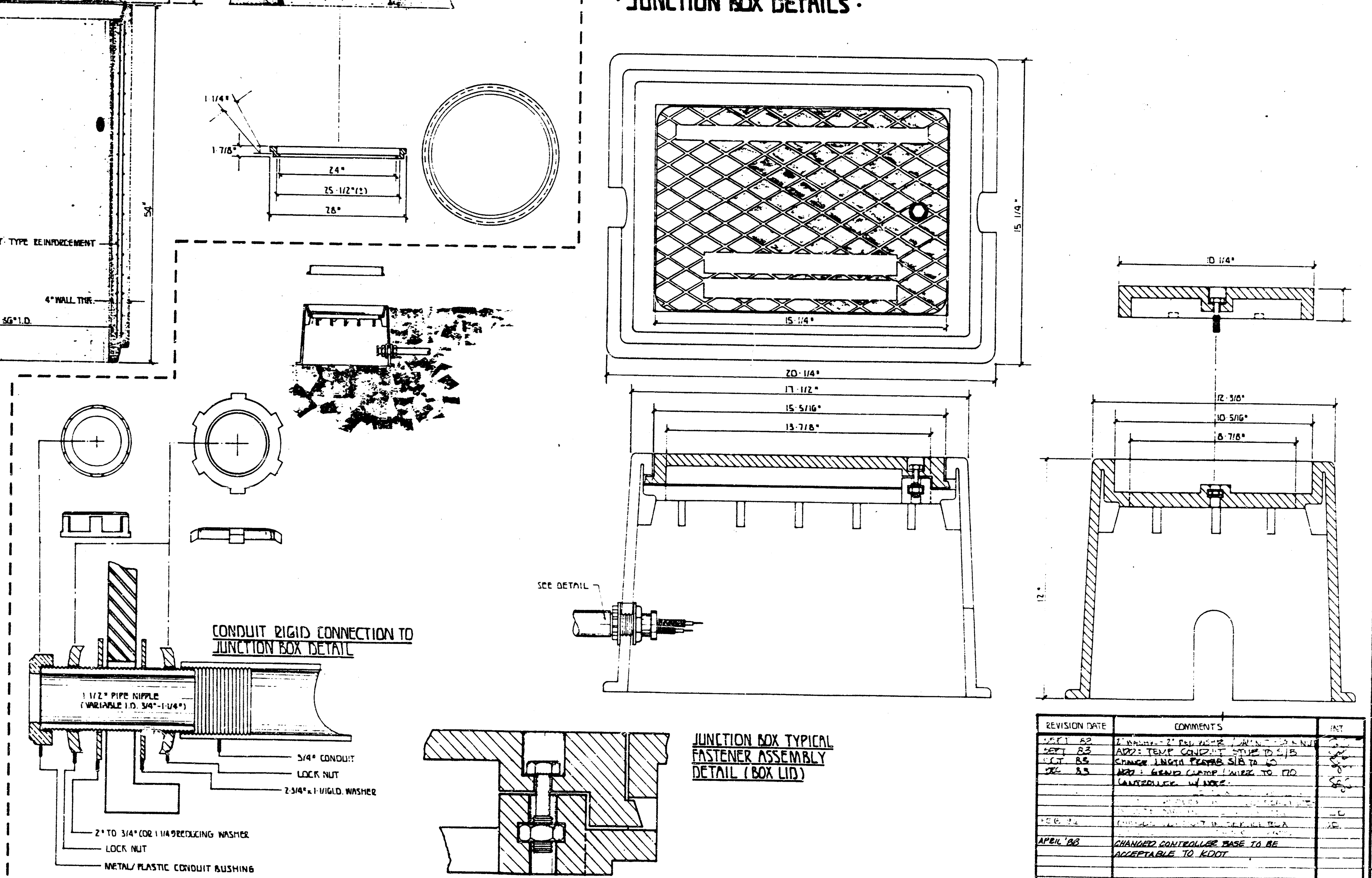
CONDUIT/DETECTOR WIRE INSTALLATION DETAILS



CONTROLLER PAD DETAILS FOR TYPE 170 CONTROLLER



JUNCTION BOX DETAILS



NOTES:

SERVICE BOX:

1. CONDUIT CONNECTION TO BE FLUSH TO WITHIN 5" OF INSIDE FACE OF SIDE WALL WITH ABILITY TO DRAIN CONDUIT INTO SERVICE BOX.
2. CONDUIT CONNECTIONS TO SERVICE BOX SHALL BE TERMINATED WITH PLASTIC CABLE BUSHING.
3. CONDUIT SHALL BE SEALED WITH APPROVED SEALER AT INSIDE WALL FACE.
4. A PRE-CAST SERVICE BOX WITH OPEN BOTTOM WILL BE ACCEPTED AS ALTERNATE: SUBJECT TO APPROVAL BY ENGINEER.

JUNCTION BOX:

1. BOX TO BE INSTALLED FLUSH WITH GROUND LEVEL (VARIABLE WITH BOX HEIGHT.)
2. A.R.S.(PLASTIC) JUNCTION BOX TO BE USED. OTHER DESIGNS OF SIMILAR SIZE & SHAPE MAY BE USED AS ACCEPTABLE ALTERNATIVE: SUBJECT TO APPROVAL.

TRENCHING:

1. CONDUIT DEPTH TO BE 30" MINIMUM AS SHOWN WITH ROCK & STUBBLE-FREE BACKFILL TO SERVE AS BEDDING MAT'L. MAINTAIN MINIMUM CONDUIT DEPTH IN TRENCH.
2. BACKFILL TO BE COMPACTED IN 6" LOOSE LIFTS BY HAND OR MECHANICAL TAMPING TO A 95% STANDARD DENSITY.
3. SLOPE CONDUIT TO DRAIN AS DIRECTED BY THE ENGINEER.
4. 3" RIGID GALV. STL. CONDUIT - BETWEEN SERV. BOXES.
   1-1/4" " " " - BTWN. S/B & JUNC. BOXES
   3/4" " " " - BTWN. J/B & CURB FACE

REVISION DATE	COMMENTS	INT.
SEPT 83	[illegible]	[illegible]
SEPT 83	ADD: TEMP CONDUIT STUB TO S/B	[illegible]
OCT. 83	CHANGE LNGTH REBAR S/B TO 6	[illegible]
DEC 83	ADD: GRND CLAMP / WIRE TO 170 CONTROLLER W/ NOTE	[illegible]
FEB 84	[illegible]	[illegible]
APRIL '88	CHANGED CONTROLLER BASE TO BE ACCEPTABLE TO KDOT	

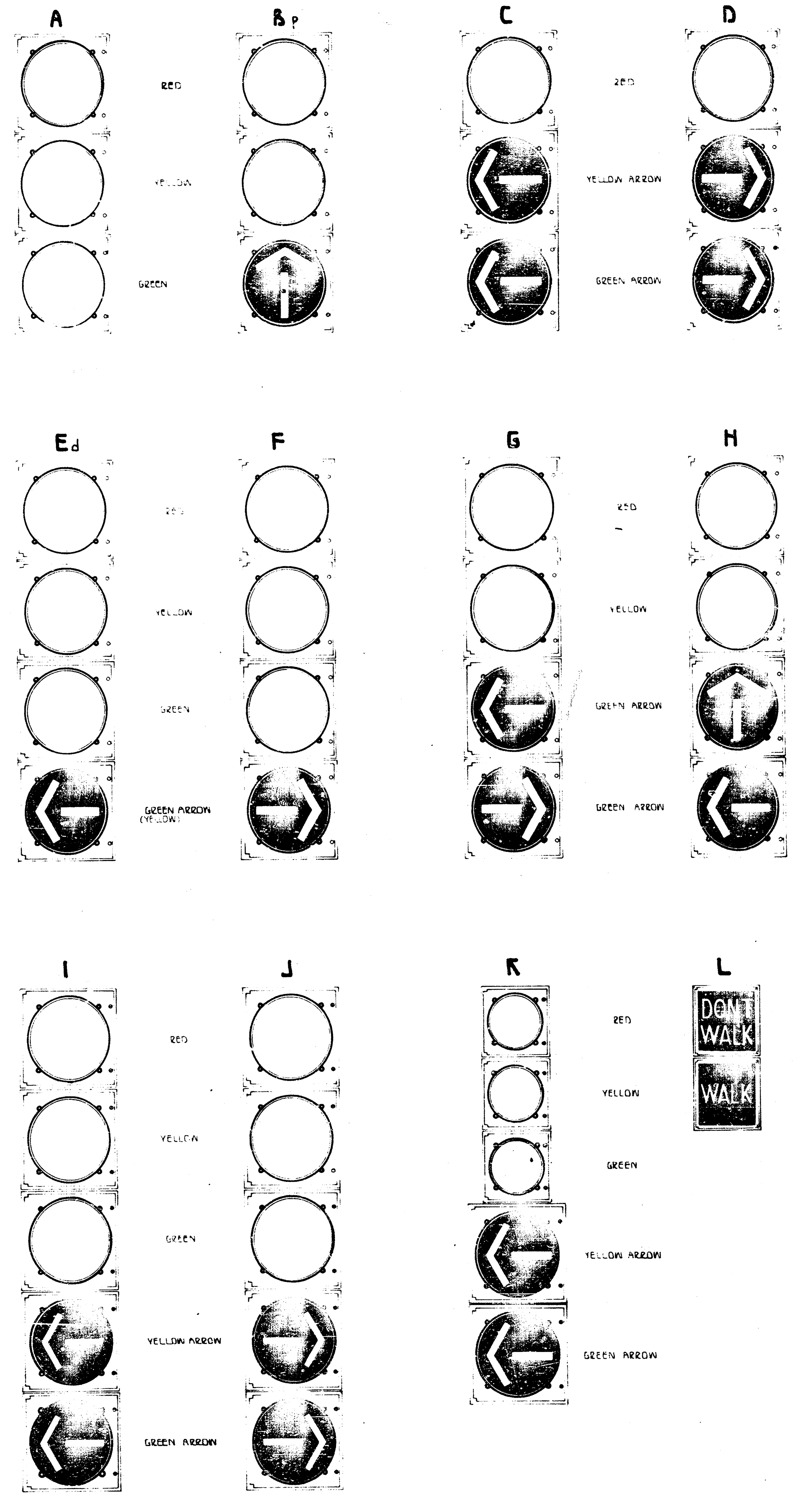
PROJECT DESCRIPTION
SERVICE / JUNCTION BOX, CONTROLLER PAD CONSTRUCTION/ INSTALLATION DETAILS

PROJECT NUMBER
472-76-245-81644-000-000-001

BOOK NO.	APPROVED BY	DATE AUG 83
DRAWN BY SEAL		REVISED

CITY OF WICHITA
DEPARTMENT OF PUBLIC WORKS

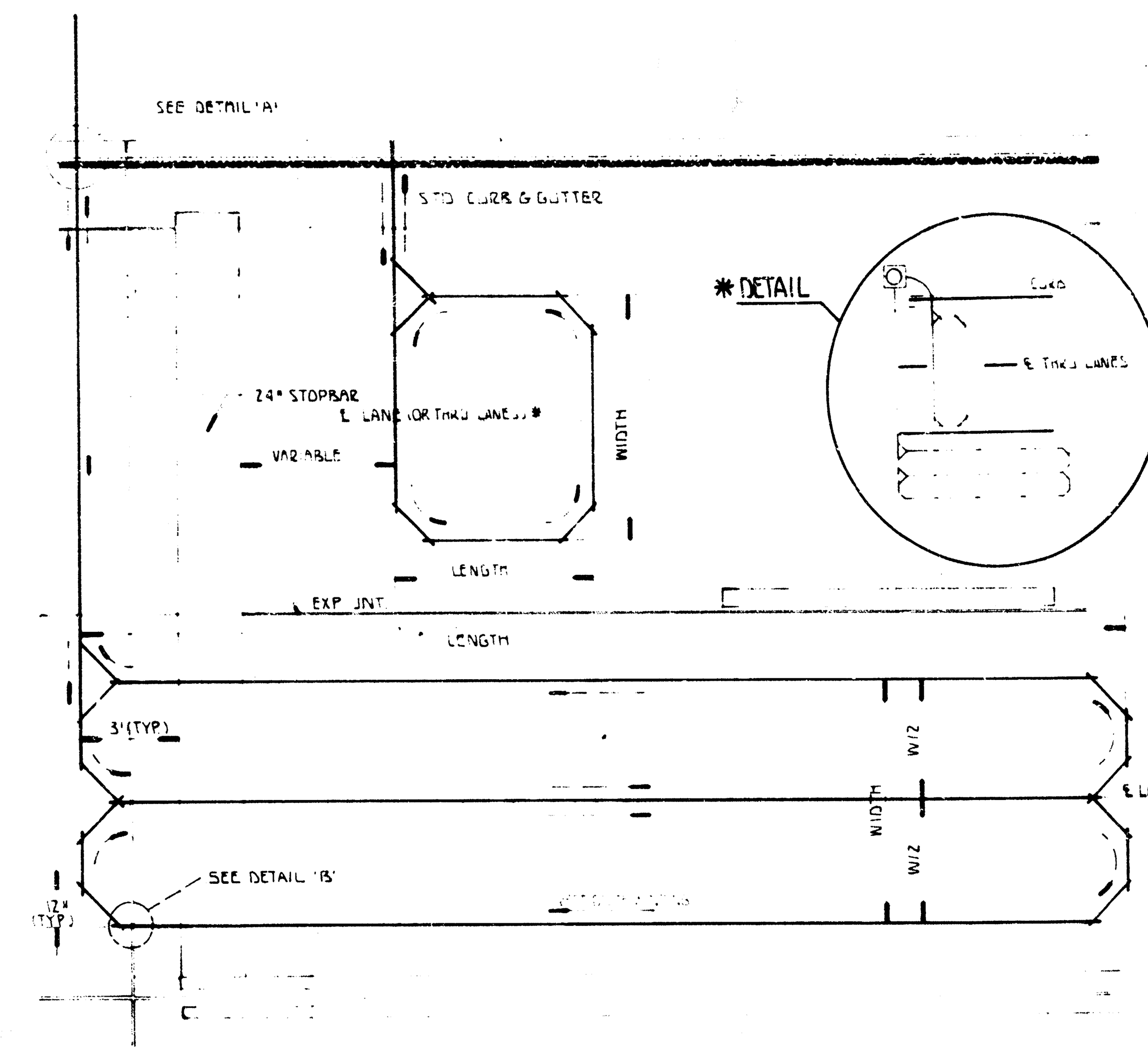
TRAFFIC ENGINEERING DIVISION
WM. G. McKINLEY TRAFFIC ENGINEER
SCALE NO SCALE

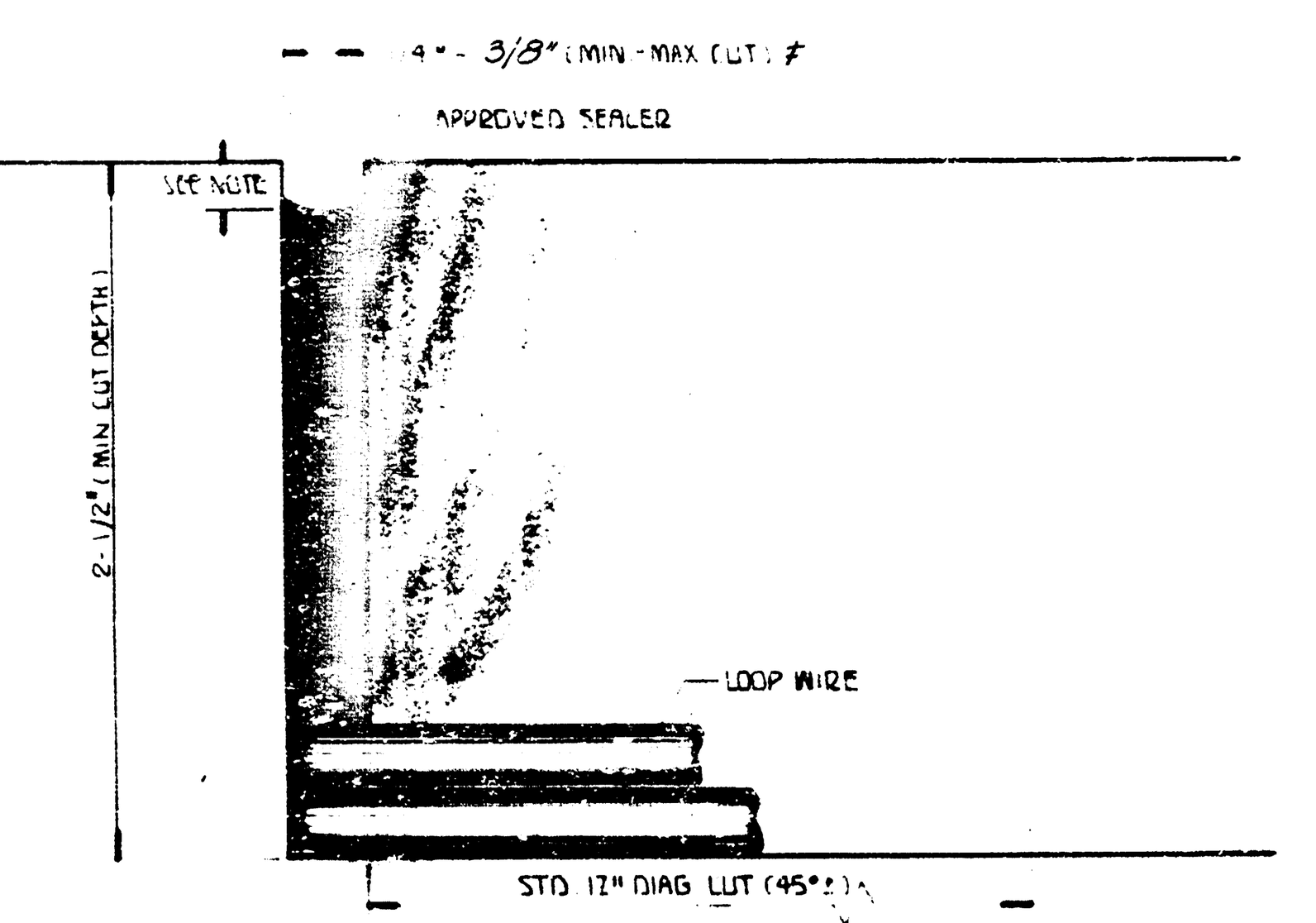


SIGNAL FACE ARRANGEMENT

SIGNAL 'B' IS PROGRAMMED TYPE(p).
SIGNAL 'E' IS DUAL-MODE GREEN/YELLOW ARROW SECTION TYPE (d)
SIGNAL 'K' IS TYPICAL 5-SECTION ARRANGEMENT USED BY C. of W.
(8" 3-SECT. w/12" ARROWS.)

LOOP CONSTRUCTION / INSTALLATION DETAILS



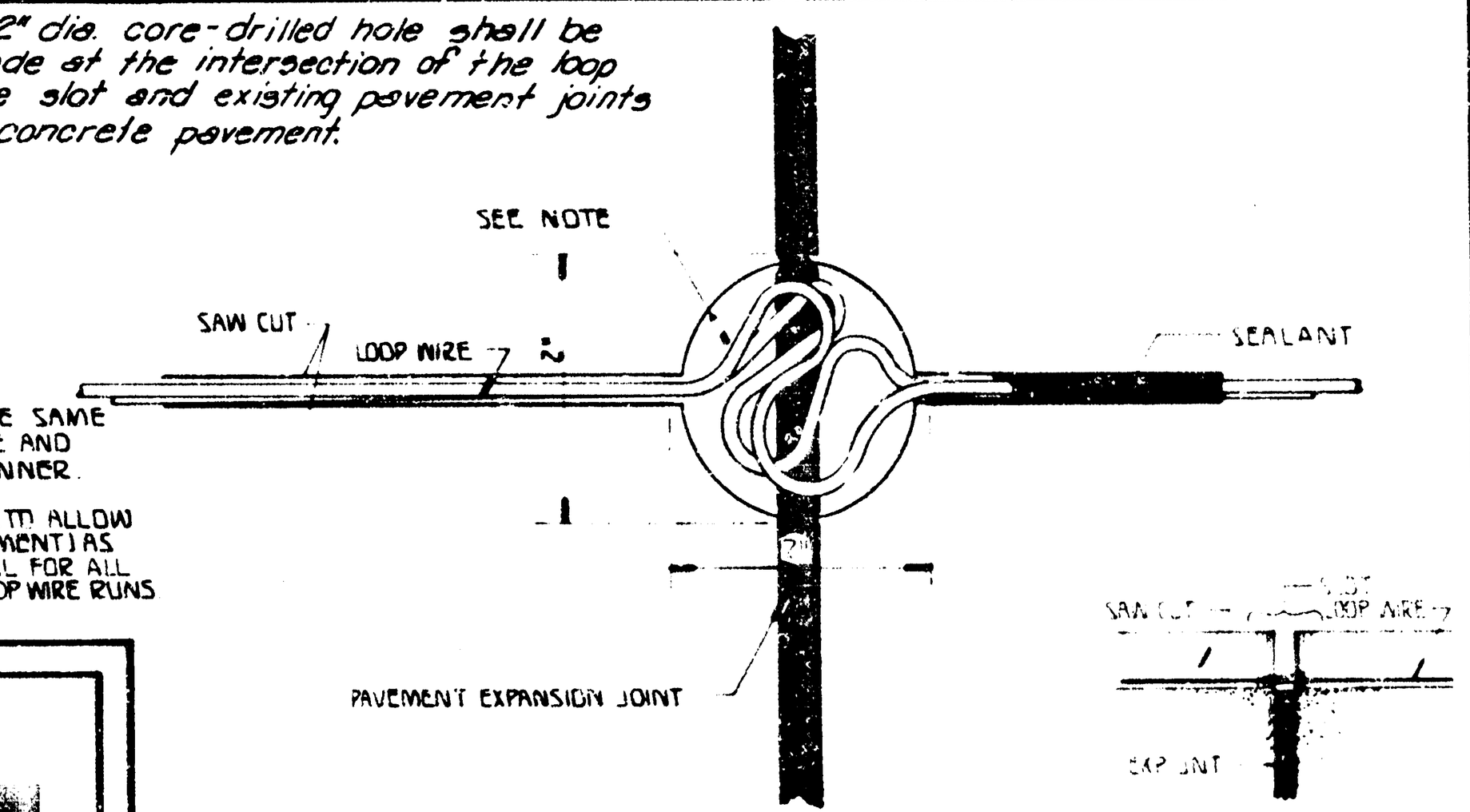


DETAIL 'C'

1. ALL LOOPS TO BE WOUND IN THE SAME DIRECTION WITH START AND END CLEARLY MARKED AT SERVICE OR JUNCTION BOX. THE LOOP WIRE BETWEEN THE LOOP AND THE JUNCTION BOX SHALL BE TWISTED 2 TURNS PER FOOT.
2. LOOP SLOT TO BE FILLED TO WITHIN 1/8" OF PAVEMENT SURFACE WITH HOT POUR SEALANT. (TRIRAM LOOP SEALANT # PR 26-HA OR APPROVED EQUAL)

\# Sufficient width shall be provided to accommodate the twisted loop wire leads where applicable.

3. A 2" dia. core-drilled hole shall be made at the intersection of the loop wire slot and existing pavement joints in concrete pavement.



DETAIL 'B'

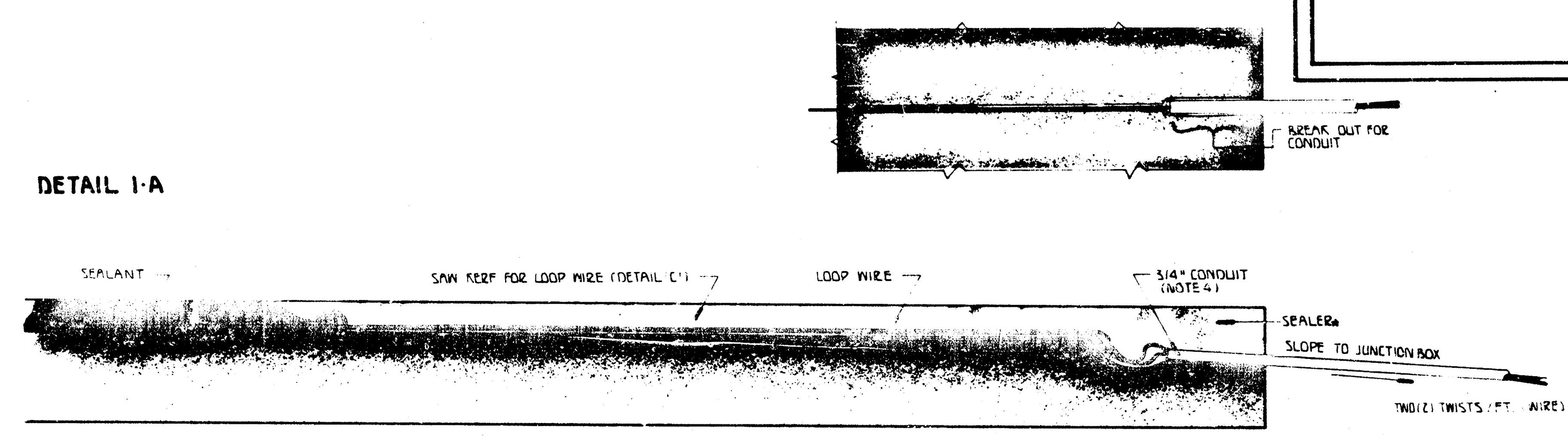
1. THE AREA REMOVED SHALL BE TO THE SAME DEPTH AS THE LOOP OR LEAD IN WIRE AND SHALL BE SEALED IN THE SAME MANNER.
2. THE LOOP WIRE SHALL HAVE 2" SLACK (TO ALLOW FOR EXPANSION / CONTRACTION OF PAVEMENT) AS SHOWN IN SLOT. TREATMENT IS TYPICAL FOR ALL INTERSECTIONS OF PVMT. JOINTS AND LOOP WIRE RUNS.

NOTES:

The loop slot saw curf connecting the loop to the edge of pavement for each loop shall be separated from any other loop slot by a minimum of 12"

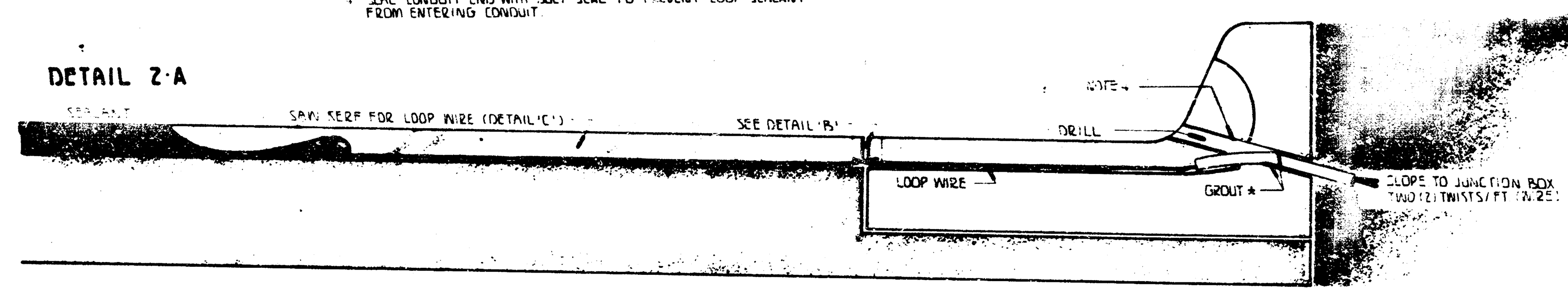
A separate loop shall be made for each loop as shown on the plans.

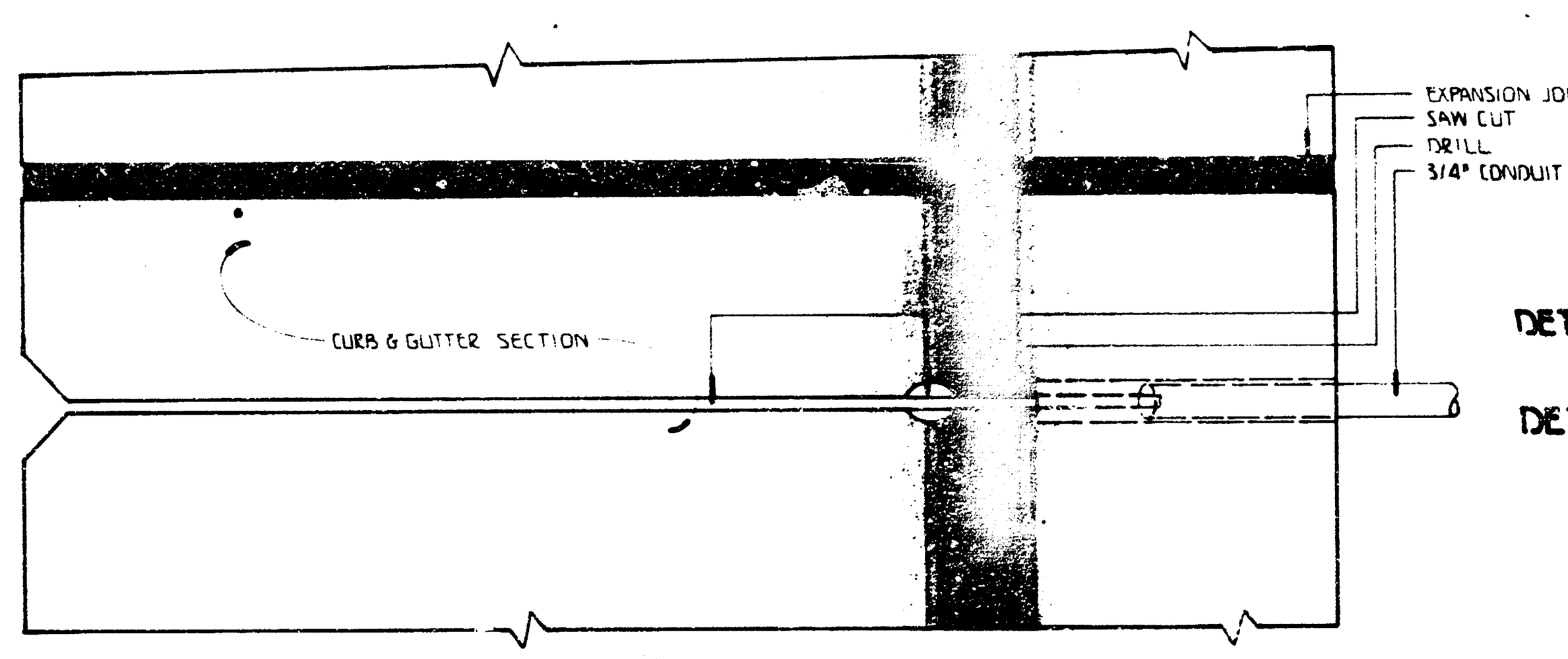
DETAIL 1-A



* 1. 3/4" CONDUIT TO BE EMBEDDED INTO PAVEMENT A MINIMUM OF 4" AND GROUTED INTO PLACE (ASPH. MAT: CONDUIT TO BE SEALED INTO PLACE) USE TRIRAM LOOP SEALANT # PR 26-HA OR EQUAL.
2. THE CONDUIT (3/4") SHALL SLOPE DOWNWARD FROM BACK OF CURB (OR EDGE OF PAVEMENT) INTO THE JUNCTION BOX. SEE DETAIL SHEET FOR SERVICE / JUNCTION BOX CONSTRUCTION / INSTALLATION FOR HOOK-UP DETAILS.
3. NO EXPANSION JOINT IN THE PAVEMENT OR CURB & GUTTER SHALL BE UTILIZED IN THE PLACEMENT OF LOOP WIRE RUNS OR CONDUIT EMBEDDING; NOR SHALL THE LOOP WIRE OR CONDUIT PASS THRU THE CURB & GUTTER OR EDGE OF PAVEMENT IN ANY PART OF ANY DRIVE APPROACH AND/OR CORNER RADII.
4. SEAL CONDUIT END WITH DUCT SEAL TO PREVENT LOOP SEALANT FROM ENTERING CONDUIT.

DETAIL 2-A





DETAIL 1-A: ASPHALT MAT PAVEMENT (NO C & G)

DETAIL 2-A: ASPH. OR CONC. PAVEMENT (FULL C & G)

PROJECT DESCRIPTION **SIGNAL FACE ARRANGEMENT / LOOP DETECTOR CONSTRUCTION AND INSTALLATION DETAILS**		
PROJECT NUMBER 472-76-245-81644-000-000-001		
BOOK NO.	APPROVED BY	DATE SEPT 83
DRAWN BY		REVISED
CITY OF WICHITA **DEPARTMENT OF OPERATIONS AND MAINTENANCE**		7/12
DIVISION OF TRAFFIC ENGINEERING WM. G. McKINLEY TRAFFIC ENGINEER		SCALE DO NOT SCALE. FOR INFORMATION ONLY.

PROJECT NO.	SHEET NO.	TOTAL SHEETS
472-76-245-81644-000-000-001	8	12

SECTION 1 - TRAFFIC SIGNAL INSTALLATION

01. GENERAL. THIS SPECIFICATION IS INTENDED TO DESCRIBE THE METHOD AND CONSTRUCTION REQUIREMENTS FOR THE INSTALLATION OF A TRAFFIC SIGNAL. THE INSTALLATION SHALL INCLUDE ALL POLES, BASES, CABINETS, CONTROLLERS, CABLES, CONDUITS, SERVICE BOXES, JUNCTION BOXES, WIRING, SIGNAL HEADS, DETECTORS AND SUCH OTHER MISCELLANEOUS PARTS OR MATERIALS AS SHOWN ON THE PLANS OR AS OTHERWISE REQUIRED OR SPECIFIED.

THE CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH AND INSTALL ALL EQUIPMENT NECESSARY FOR THE COMPLETE AND SATISFACTORY OPERATION OF THE TRAFFIC SIGNAL, WHETHER SAID EQUIPMENT IS SPECIFICALLY MENTIONED OR NOT.

THE CONTRACTOR SHALL CONTACT ANY AND ALL LOCAL AGENCIES HAVING JURISDICTION OVER SUCH INSTALLATIONS AND ACQUIRE ANY PERMITS OR LICENSES THAT MAY BE REQUIRED. COPIES OF ANY PERMITS OR LICENSES SHALL BE SUPPLIED TO THE ENGINEER PRIOR TO BEGINNING ANY CONSTRUCTION OR INSTALLATION. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL ORDINANCES OR APPLICABLE BUILDING CODES.

THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE POWER COMPANY PRIOR TO ANY SERVICE CONNECTION TO DETERMINE THE PROPER TYPE AND METHOD OF HOOK-UP FOR THE PARTICULAR LOCALE. THE COST OF ANY INITIAL HOOK-UP CHARGE SHALL BE BORNE BY THE CONTRACTOR. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE COST OF POWER SUPPLIED FOR ALL TESTING UNTIL THE SIGNAL INSTALLATION IS ACCEPTED.

IN SO FAR AS PRACTICABLE, MAJOR ITEMS OF ELECTRONIC EQUIPMENT SUCH AS THE TRAFFIC SIGNAL CONTROLLER AND LOOP DETECTOR AMPLIFIERS PROVIDED AND INSTALLED UNDER THIS CONTRACT SHALL BE OF ONE TYPE AND CONSIST OF PRODUCTS OF THE SAME SUPPLIER IN ORDER TO SECURE UNIFORMITY, SINGLE RESPONSIBILITY, AND MOST SATISFACTORY SERVICE.

THE CONTRACTOR SHALL ARRANGE FOR THE SUPPLIER OF THE MAJOR ITEMS OF ELECTRONIC EQUIPMENT TO HAVE A REPRESENTATIVE AT THE SITE PRIOR TO ENERGIZING THE SIGNAL.

THE CONTRACTOR SHALL NOTIFY ANY UTILITY COMPANIES WHICH MAY HAVE FACILITIES IN THE WORK AREA. ALL COSTS OF UTILITY RELOCATION SHALL BE BORNE BY THE OWNER.

ADJUSTMENTS IN ELEVATION OF SERVICE BOXES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

02. CONDUIT. ALL CONDUCTORS SHALL BE RUN BETWEEN BASES, JUNCTION BOXES, PULL BOXES, AND SERVICES BOXES IN RIGID CONDUIT CONFORMING TO THE PROVISIONS OF SECTION 2 OF THESE SPECIFICATIONS. THE SIZE OF THE CONDUIT USED SHALL BE OF THE SIZE AS SHOWN ON THE PLANS EXCEPT THAT THE CONTRACTOR MAY, AT HIS OWN EXPENSE, USE A LARGER SIZE CONDUIT IF DESIRED. WHERE LARGER SIZE CONDUIT IS USED, IT SHALL BE FOR THE ENTIRE RUN FROM OUTLET TO OUTLET. NO REDUCING COUPLINGS WILL BE PERMITTED.

THE ENDS OF ALL CONDUIT SHALL BE WELL REAMED TO REMOVE BURRS AND ROUGH EDGES. FIELD CUTS SHALL BE MADE SQUARE AND TRUE SO THAT THE ENDS WILL BUTT OR COME TOGETHER FOR THE FULL DIAMETER THEROF. SLIP JOINTS OR RUNNING THREADS WILL NOT BE PERMITTED FOR COUPLING CONDUIT. WHEN A STANDARD COUPLING CANNOT BE USED, AN APPROVED THREADED UNION CONDUIT SHALL BE USED. THE THREADS ON ALL CONDUIT SHALL BE PAINTED WITH A GOOD QUALITY OF LEAD OR RUST PREVENTATIVE PAINT BEFORE COUPLINGS ARE MADE. ALL COUPLINGS SHALL BE FITTED AND TIGHTENED UNTIL THE END OF THE CONDUITS ARE BROUGHT TOGETHER. WHERE COATING ON CONDUIT HAS BEEN INJURED IN HANDLING, OR INSTALLING, SUCH INJURED PLACES SHALL BE THOROUGHLY PAINTED WITH RUST PREVENTATIVE PAINT.

ALL CONDUIT ENDS SHALL BE THREADED AND CAPPED WITH STANDARD PIPE CAPS UNTIL WIRING IS STARTED. WHEN CAPS ARE REMOVED, THE THREADED ENDS SHALL BE PROVIDED WITH APPROVED CONDUIT BUSHINGS.

THE LOCATION OF ENDS OF ALL CONDUIT FOR FUTURE ELECTRICAL CIRCUITS IN STRUCTURES SHALL BE MARKED BY A "Y" AT LEAST THREE INCHES (3") HIGH CUT INTO THE FACE OF CURB, SIDEWALK, GUTTER OR WALL DIRECTLY ABOVE THE CONDUIT.

CONDUIT BENDS, EXCEPT FACTORY BENDS, SHALL HAVE A RADIUS OF NOT LESS THAN SIX (6) TIMES THE INSIDE DIAMETER OF THE CONDUIT. WHERE FACTORY BENDS ARE NOT USED, CONDUIT BENDS SHALL BE MADE WITHOUT CRIMPING OR FLATTENING, USING THE LONGEST RADIUS PRACTICABLE.

CONDUIT SET IN BASES SHALL EXTEND TWO TO THREE INCHES (2" TO 3") VERTICALLY FROM THE TOP OF THE BASE. A PLASTIC OR METAL CONDUIT BUSHING SHALL BE INSTALLED ON THE END OF ALL CONDUIT TERMINATING WITHIN A BASE. CONDUIT ENTERING THROUGH THE BOTTOM OF A PULL BOX SHALL BE LOCATED NEAR THE ENDS TO LEAVE THE MAJOR PORTION OF THE BOX CLEAR. CONDUIT ENTERING CONCRETE SERVICE BOXES SHALL NOT *BE LESS* THAN SIX INCHES (6")ABOVE BOTTOM OF CONCRETE WALL AND EXTEND MORE THAN 5" INSIDE OF SERVICE BOX. CONDUIT ENTERING PULL BOXES SHALL TERMINATE IN A THREADED BELL FITTING FLUSH WITH THE INSIDE OF THE BOX WALL AND NOT LESS THAN TWO INCHES (2") ABOVE THE BOTTOM. CONDUIT SHOULD BE SLOPED TO DRAIN AS DIRECTED BY THE ENGINEER. AT ALL OUTLETS, CONDUITS SHALL ENTER FROM THE DIRECTION OF THE RUN.

WHEREVER POSSIBLE, THE CONDUIT SHALL BE INSTALLED BY TRENCHING. TRENCHES SHALL RUN IN STRAIGHT LINES BETWEEN PULL BOXES AND BASES. THE LOCATION OF THE CONDUIT SHALL BE AS SHOWN ON THE PLANS, EXCEPT THAT WHERE PHYSICAL OBSTRUCTIONS DICTATE, THE LOCATION SHALL BE DETERMINED BY THE ENGINEER. CONDUIT SHALL BE INSTALLED TO A DEPTH OF AT LEAST THIRTY INCHES (30") BELOW FINISH GRADE. THIS REQUIREMENT MAY BE WAIVED BY THE ENGINEER WHERE PHYSICAL CONDITIONS OR OBSTRUCTIONS WARRANT.

TRENCHES SHALL BE BACKFILLED WITH MATERIAL FREE OF ROCK AND COMPACTED IN LIFTS BY HAND TAMPING OR WITH MECHANICAL TAMPERS TO THE DENSITY NOTED ON THE PLANS. IF A DENSITY IS NOT SPECIFIED ON THE PLANS, TRENCH BACKFILL SHALL BE COMPACTED UNTIL, IN THE OPINION OF THE ENGINEER, NO SIGNIFICANT FUTURE SETTLEMENT WILL OCCUR.

EXISTING UNDERGROUND CONDUIT TO BE INCORPORATED INTO A NEW SYSTEM SHALL BE CLEANED WITH A MANDREL AND BLOWN OUT WITH COMPRESSED AIR.

CONDUIT RUNS SHOWN ON THE PLANS ARE FOR BIDDING PURPOSES ONLY, AND MAY BE CHANGED WITH PERMISSION OF THE ENGINEER TO AVOID UNDERGROUND OBSTRUCTIONS.

CONDUIT PLACED UNDER EXISTING PAVEMENT OR SIDEWALK SHALL BE INSTALLED BY AN APPROVED JACKING OR DRILLING METHOD. THE EXISTING PAVEMENT SHALL NOT BE DISTURBED UNLESS OTHERWISE NOTED ON THE PLANS OR APPROVED BY THE ENGINEER. EXCESSIVE USE OF WATER SUCH THAT THE PAVEMENT MIGHT BE UNDERMINED, OR THE SUBGRADE SOFTENED, WILL NOT BE PERMITTED.

03. CONCRETE BASE FOR POLES AND CONTROLLER CABINET. BASES FOR POLES AND CABINETS SHALL BE REINFORCED CONCRETE AS DETAILED ON THE PLANS. THE CONCRETE SHALL BE CLASS 1. THE REINFORCING BARS SHALL BE FREE OF RUST AND DIRT AND SHALL BE OF THE SIZE, NUMBER AND DIMENSIONS SHOWN ON THE PLANS.

ANCHOR BOLTS SHALL BE OF THE SIZE AND DESIGN RECOMMENDED BY THE MANUFACTURER OF THE PARTICULAR POLE TO BE INSTALLED. THEY SHALL EXTEND UNIFORMILY ABOVE THE TOP OF THE CONCRETE BASE A HEIGHT EQUAL TO THE MANUFACTURERS RECOMMENDATIONS.

A 5/8" X 12'-0" COOPERWELD GROUND ROD SHALL BE INSTALLED IN EACH BASE AS SHOWN ON THE PLANS.

THE CONTRACTOR SHALL DESIGN AN ANCHOR BOLT ASSEMBLY WHICH SHALL BE WELDED TO THE REBAR CAGE AND THE RESULTING UNIT INSERTED IN THE FORM FOR THE CONCRETE BASE. THE UNIT SHALL BE DESIGNED AND CONSTRUCTED SUCH THAT, AFTER INSERTION IN THE FORM, IT CAN BE CHECKED FOR PROPER ORIENTATION, ELEVATION AND VERTICALITY. "~~S~~TABBING" OF ANCHOR BOLTS OR GROUND RODS WILL NOT BE PERMITTED.

THE LOCATION OF THE BASES SHALL BE AS SHOWN ON THE PLANS. ANY VARIATION FROM THE PLAN LOCATION SHALL BE ONLY WITH THE APPROVAL OF THE ENGINEER.

STEEL TRAFFIC SIGNAL POLE BASES SHALL BE CONSTRUCTED IN TWO POURS. THE INITIAL CONCRETE PLACEMENT SHALL END SIX INCHES (6") BELOW FINISH GRADE. A SIX INCH (6") THICK SQUARE CONCRETE CAP SHALL BE POURED WHEN THE POLE HAS BEEN ERECTED AND PLUMBED. THE TOP OF THE BASE SHALL BE SLIGHTLY (1/4" TO 1/2") HIGHER THAN THE ADJACENT CURB AND GUTTER, OR FINISH GRADE IF NO CURB AND GUTTER. ALUMINUM PEDESTAL BASES SHALL BE CONSTRUCTED IN ONE POUR AS DETAILED ON THE PLANS.

04. WIRING. WIRING SHALL CONFORM TO THE APPROPRIATE ARTICLES OF THE NATIONAL ELECTRIC CODE OR SUBSEQUENT REVISIONS. WHEREVER POSSIBLE, THE CONDUCTOR FROM THE TERMINAL BLOCK IN THE CONTROLLER TO THE SIGNAL BASE SHALL BE A CONTINUOUS RUN. NO SPLICES OF CABLE WILL BE PERMITTED IN CONDUIT OR OUT-SIDE OF JUNCTION BOXES, SERVICE BOXES OR POLE BASES UNLESS OTHERWISE SPECIFIED IN THE SUPPLEMENTAL SPECIFICATIONS, SPECIAL PROVISIONS, OR ON THE PLANS FOR AN OVERHEAD WIRING SYSTEM. WHEN POSSIBLE, ALL SPLICES SHALL BE MADE ABOVE GROUND IN POLE OR PEDESTAL BASES.

WHEN CONDUCTORS AND CABLES ARE PULLED INTO THE CONDUIT, ALL ENDS SHALL BE TAPED TO EXCLUDE MOISTURE, AND SHALL BE SO KEPT UNTIL THE SPLICES ARE MADE OR TERMINAL APPLIANCES ATTACHED. ENDS OF SPARE CONDUCTORS SHALL REMAIN TAPED.

WHEN PULLING CONDUCTORS THROUGH CONDUITS, A POWDERED SOAPSTONE, TALC OR OTHER APPROVED LUBRICANT SHALL BE USED.

SIX FEET (6') OF SLACK OR EXCESS CABLE, AS APPLICABLE, SHALL BE LEFT IN EACH SERVICE BOX FOR TRAFFIC SIGNAL CABLE, AND DETECTOR LEAD-IN WIRE. ALL CABLES SHALL BE UNIFORMLY BUNDLED AND SECURED AS CLOSE AS PRACTICAL TO THE TOP OF THE SERVICE HOLE WITH ONE-HOLE CONDUIT STRAPS OF ADEQUATE SIZE.

A. SPLICES.

(1) SIGNAL CONDUCTOR CABLE. CONDUCTORS SHALL BE JOINED BY TWISTING THE CONDUCTORS. CONDUCTOR INSULATION SHALL BE PENCILED, TRIMMED TO CONICAL SHAPE, BEFORE APPLYING SPLICE INSULATION. SPLICE INSULATION SHALL CONSIST OF LAYERS OF THERMOPLASTIC OR NEOPRENE INSULATION ELECTRICAL TYPE BEARING THE LABEL OF THE UNDERWRITERS LABORATORIES, INC., APPLIED TO A THICKNESS EQUAL TO AND WELL LAPPED OVER THE ORIGINAL INSULATION, EXCEPT THAT ON HIGH VOLTAGE SPLICES TWO LAYERS OF RUBBER TAPE CONFORMING TO THE REQUIREMENTS AT A.S.T.M. DES'GNATION: D 119 SHALL BE APPLIED OVER THE CONDUCTOR BEFORE PLACING THE THERMOPLASTIC TAPE. THE SPLICE SHALL THEN BE WELL COVERED WITH TWO LAYERS OF FRICTION OR OTHER APPROVED TAPE. AT LEAST TWO FEET (2') OF SLACK SHALL BE LEFT FOR EACH CABLE AT EACH SPLICE.

WHEN TERMINATING ENDS OF CABLE AT ALL TERMINAL BLOCKS AN APPROVED #14 INSULATED SPADE TERMINAL SHALL BE PROPERLY CRIMPED ON END OF EACH CONDUCTOR TO PROVIDE A SECURE CONNECTION.

05. TRAFFIC SIGNAL HEADS. TRAFFIC SIGNAL HEADS MOUNTED ON THE SIDE OF POLES OR ON PEDESTALS SHALL BE TEN FEET (10') FROM THE GROUND TO THE BOTTOM OF THE SIGNAL HEAD.

TRAFFIC SIGNAL HEADS MOUNTED ON MAST ARMS OR SPAN WIRE SHALL BE NO LESS THAN SIXTEEN FEET (16') AND NO MORE THAN NINETEEN FEET (19') FROM THE PAVEMENT TO THE BOTTOM OF THE SIGNAL HEAD. IN SOME INSTANCES THE ENGINEER MAY REQUIRE THE SIGNAL TO BE MOUNTED ABOVE SIXTEEN FEET (16') FOR BETTER VISIBILITY. UNDER NO CIRCUMSTANCES SHALL THE BOTTOM OF THE SIGNAL BE MORE THAN NINETEEN FEET (19') ABOVE THE PAVEMENT.

THE ENGINEER SHALL DIRECT THE FINAL POSITIONING OF THE SIGNAL HEADS. SIGNAL HEADS SHALL NOT BE INSTALLED AT ANY INTERSECTION UNTIL ALL OTHER SIGNAL EQUIPMENT, INCLUDING THE CONTROLLER, IS IN PLACE AND READY FOR OPERATION AT THAT INTERSECTION, EXCEPT THAT THE SIGNAL HEADS MAY BE MOUNTED IF THE FACES ARE NOT DIRECTED TOWARD TRAFFIC OR IF THE FACES ARE COVERED.

06. POLE INSTALLATION. WHEN INSTALLED, THE TRAFFIC SIGNAL POLES SHALL BE BACK RAKED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION TO ALLOW FOR DEFLECTION, SUCH THAT THE POLE WILL BE PLUMB WHEN LOADED.

07. AC SERVICE INPUT. EACH SERVICE DISCONNECT MUST BE FURNISHED WITH AN INSTALLED LIGHTNING ARRESTOR ON THE AC SERVICE INPUT WHICH MEETS OR EXCEEDS THE FOLLOWING REQUIREMENTS:

(A) THE UNIT MUST BE CAPABLE OF WITHSTANDING REPEATED 20,000 AMPERE SURGES (MINIMUM OF 20).

(B) THE UNIT MUST HAVE INTERNAL FOLLOW - CURRENT LIMITERS (RESISTIVE ELEMENTS).

(C) THE UNIT MUST CONTAIN THREE ACTIVE CLAMPING STAGES MINIMUM.

(D) THE UNIT MUST SELF-EXTINGUISH WITHIN 8.3 MILLISECONDS AFTER THE TRAILING EDGE OF THE SURGE.

(E) THE PARALLEL IMPEDANCE OF LIMITERS MUST BE LESS THAN 0.15 OHMS.

(F) Unit to be U.L. Approved.

08. ELECTRICAL WIRE AND CABLE. ALL WIRE AND CABLE SUPPLIED UNDER THIS SPECIFICATION SHALL BE APPROVED BASED UPON CATALOG CUTS SUBMITTED TO THE ENGINEER. IN ADDITION, ALL WIRE AND CABLE SHALL BE VISUALLY INSPECTED BY THE ENGINEER. ANY APPARENT DEFECT THAT MAY SHORTEN THE SERVICE LIFE OF THE WIRE OR CABLE SHALL BE CAUSE FOR REJECTION.

~~A. SHIELDED LOOP DETECTOR LEAD-IN CABLE. UNLESS OTHERWISE SPECIFIED, SHIELDED LOOP DETECTOR LEAD-IN CABLE SHALL BE BELDON 8720 #14 AWG~~.

TRAFFIC SIGNAL SPECIFICATIONS

DEPARTMENT OF OPERATIONS AND MAITENANCE
CITY OF WICHITA
TRAFFIC ENGINEERING DIVISION — WM.C.McKINLEY: TRAFFIC ENG.

Designed by		Checked by		8
Drawn by		Date	Job No.	12

PROJECT NO.	SHEET NO.	TOTAL SHEETS
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~~B. LOOP DETECTOR WIRE. UNLESS OTHERWISE SPECIFIED, LOOP DETECTOR WIRE SHALL BE STRANDED, #14 AWG, TYPE THHN 75o C, MEETING THE REQUIREMENTS OF ASTM B-8 AND U.L. STANDARD 44.~~

C. MULTI-CONDUCTOR CABLE. ALL CONDUCTOR CABLE FOR INTERSECTION SIGNALIZATION AND INTERSECTION INTERCONNECTION SHALL BE MULTICONDUCTOR CABLE OF THE SIZE SPECIFIED ON THE PLANS FOR OPERATION ON A 600V MAXIMUM, AND SUITABLE FOR USE AT CONDUCTOR TEMPERATURES NOT EXCEEDING 75o C. MATERIAL, CONSTRUCTION AND TESTS SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE INSULATED CABLE ENGINEERS ASSOCIATION STANDARD S-61-402 "THERMOPLASTIC INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY" OR IN ACCORDANCE WITH INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION, INC. (IMSA) SPECIFICATION NO. 19-1 1984.

CONDUCTORS SHALL BE SOLID OR STRANDED, ANNEALED UNCOATED COPPER OR ANNEALED COATEDCOPPER. COPPER WIRE BEFORE INSULATING OR STRANDING SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF ASTM B-33 (FOR COATED WIRE) OR ASTMB-3 (FOR UNCOATED WIRE). STRANDING SHALL BE CLASS B, IN ACCORDANCE WITH THE LATEST EDITION OF ASTM B-8.

INSULATION FOR THE INDIVIDUAL CONDUCTORS SHALL CONSIST OF A 20 MIL THICKNESS OF POLYETHYLENE, AND AN INSULATION COVERING OF A POLYVINYL CHLORIDECOMPOUND WITH A 10 MIL THICKNESS.

THE POLYETHYLENE INSULATION SHALL MEET THE REQUIREMENTS OF PARAGRAPH 3.9 OF ICEA STANDARD S-61-402 BEFORE APPLICATION TO THE CONDUCTOR, AND PARAGRAPH 3.9.1 AFTER APPLICATION TO THE CONDUCTOR.

THE POLYVINYL CHLORIDE INSULATION COVERING SHALL MEET THE REQUIREMENTS OF PARAGRAPH 4.3.1 OF ICEA STANDARD S-61-402, AND SHALL BE COLOR CODED IN ACCORDANCE WITH METHOD 1, PART 5 OF ICEA STANDARD S-61-402.

THE OVERALL CABLE JACKET SHALL CONSIST OF A POLYVINYL CHLORIDE COMPOUND WHICH WILL PROVIDE A TOUGH, HEAT, MOISTURE, OZONE, AND FLAME RESISTANT COVERING MEETING THE REQUIREMENTS OF PARAGRAPH 4.3.1 OF ICEA STANDARD S-61-402. THE OVERALL JACKET THICKNESS SHALL BE IN ACCORDANCE WITH TABLE 18, PART 4, ICEA STANDARD S-61-402.

CONDUCTOR CABLE USED FOR THE SIGNAL CONTROL CIRCUITS SHALL BE #14 AWG MULTI-CONDUCTOR CABLE, MEETING THE ABOVE REQUIREMENTS.

CONDUCTOR CABLE USED FOR INTERSECTION INTERCONNECTION SHALL BE #12 AWG MULTI-CONDUCTOR CABLE, MEETING THE ABOVE REQUIREMENTS.

D. POWER SUPPLY WIRE. INTERSECTION SIGNALIZATION POWER SUPPLY WIRE SHALL BE SINGLE CONDUCTOR WIRE FOR OPERATION ON A 600V MAXIMUM, AND SUITABLE FOR USE AT CONDUCTOR TEMPERATURES NOT EXCEEDING 75o C. MATERIAL, CONSTRUCTION AND TESTS SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE ICEA STANDARD S-66-524 "CROSS-LINKED-THERMOSETTING-POLYETHYLENE-INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY".

CONDUCTORS SHALL BE STRANDED, ANNEALED COATED COPPER. COPPER WIRE BEFORE INSULATING OR STRANDING, SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF ASTM B-33 (FOR COATED WIRE). STRANDING SHALL BE CLASS B, IN ACCORDANCE WITH THE LATEST EDITION OF ASTM B-8.

REFER TO DRAWINGS FOR SIZE AND TYPE OF WIRE REQUIRED.

09. STEEL MAST ARM TYPE TRAFFIC SIGNAL STANDARDS. THE FOLLOWING SPECIFICATION SHALL GOVERN THE DESIGN OF STEEL MAST ARMS WITH POLES AND BASES UNLESS OTHERWISE SPECIFIED ON THE PLANS.

A. COMPLETE ASSEMBLY. ALL ITEMS FOR COMPLETE ASSEMBLY SHALL BE FURNISHED INCLUDING, BUT NOT LIMITED TO:

(1) ARM WITH SUPPORT SHAFT AND BASE

(2) FLANGE PLATES AND BOLTS FOR ATTACHMENT OF MAST ARM TO SHAFT

(3) ANCHOR BOLTS WITH NUTS AND WASHERS

(4) COVER(S) FOR THE EXPOSED ANCHOR BOLTS

(5) CAP FOR TOP OF POLE

B. DESIGN. THE COMPLETE ASSEMBLY SHALL BE DESIGNED TO SUPPORT STANDARD BACK PLATED ONE-WAY, MULTI-SECTION SIGNALS, RIGIDLY MOUNTED IN THE SPECIFIED LOCATIONS.

ALL TRAFFIC SIGNAL POLES SHALL CONFORM TO THE 1985 AASHTO "STANDARD SPECIFICATION FOR STRUCTURAL SUPPORT FOR HIGHWAY SIGNS, LUMINAIRE AND TRAFFIC SIGNALS" HANDBOOK WITH A WIND LOAD OF 80 MPH AND 1.3 GUST FACTOR.

THE SHAFT AND MAST ARM SHALL EACH BE MADE OF ONLY ONE LENGTH OF BEST GRADE HOT ROLLED, BASIC OPEN HEARTH STEEL OF NOT LESS THAN #7 MANUFACTURER'S STEEL GAUGE. ONLY ONE LONGITUDINAL WELD, AND NOT TRANSVERSE WELDS SHALL BE PERMITTED IN THE FABRICATION OF THE SHAFT AND MAST ARMS. AFTER BEING FORMED AND WELDED, THE SHAFT SHALL THEN BE LONGITUDINALLY COLD ROLLED UNDER SUFFICIENT PRESSURE TO FLATTEN THE WELD, FORM A ROUND TAPERED TUBE AND INCREASE ITS PHYSICAL CHARACTERISTICS SO THE METAL WILL HAVE A GUARANTEED MINIMUM YIELD STRENGTH OF 55,000 PSI. THE SHAFT AND ARMS SHALL HAVE A UNIFORM TAPER OF 0.14 INCHES OF DIAMETER CHANGE PER FOOT OF LENGTH. THE MAST ARM SHALL BE MANUFACTURED IN ONE PIECE FOR THE ENTIRE LENGTH OF THE MAST ARM.

A LETTER OF CERTIFICATION FROM THE MANUFACTURER AND STAMPED BY A REGISTERED PROFESSIONAL ENGINEER, SHALL BE SUBMITTED CERTIFYING COMPLIANCE TO THESE SPECIFICATIONS. IF REQUESTED, CALCULATIONS AND DETAIL DRAWINGS SHALL ALSO BE SUBMITTED FOR VERIFICATION OF COMPLIANCE TO THESE SPECIFICATIONS.

C. ANCHOR BOLTS. FOUR HIGH STRENGTH STEEL ANCHOR BOLTS WITH A MINIMUM YEILD STRENGHT OF 55,000 PSI, EACH FITTED WITH TWO NUTS AND TWO WASHERS SHALL BE FURNISHED WITH EACH POLE. EACH ANCHOR BOLT SHALL HAVE AN "L" BEND AT THE BOTTOM END AND SHALL BE THREADED AT THE TOP END. ONLY THE TOP TEN INCHES (10") ON THE THREADED ENDS OF THE ANCHOR BOLTS NEED BE GALVANIZED. THE MANUFACTURER SHALL PROPERLY MACHINE OR OTHERWISE INSURE THAT THE NUTS AND WASHERS SHALL EASILY FIT THE ANCHOR BOLTS AFTER THE GALVANIZING PROCESS.

ANCHOR BOLT SIZES ARE TO BE STANDARDIZED AS FOLLOWS:

1. MAST ARM LENGTHS 16' TO 38'
   4 - 1.50" DIA. X 54" LONG X 6" HOOK
   BOLT CIRCLE = 16"
2. MAST ARM LENGTHS 39' TO 55'
   4 - 1.75" DIA. X 84" LONG X 6" HOOK
   BOLT CIRCLE = 20"

D. ANCHOR BASE. THE BASE PLATE SHALL BE OF A STEEL MEETING OR EXCEEDING THE REQUIREMENTS OF ASTM A 36. IT SHALL BE INTERGRALLY WELDED TO THE POLE SHAFT WITH EITHER A TELESCOPIC WELDED JOINT OR A FULL PENETRATION BUTT WELD WITH A BACKUP BAR.

E. POLE SHAFT. A HANDHOLE WITH A MINIMUM AREA OF 25 SQUARE INCHES SHALL BE WELDED INTO THE SHAFT A SHORT DISTANCE ABOVE THE BASE. A COVER SHALL BE PROVIDED FOR THE HANDHOLE.

POLE TOP CAPS SHALL BE PROVIDED AND SHALL BE SECURED IN PLACE WITH SET SCREWS OR OTHER SUITABLE FASTENERS.

A "J-HOOK" WIRE SUPPORT SHALL BE PROVIDED IN EACH POLE SHAFT.

PROVISION SHALL BE MADE FOR A GROUNDING ATTACHMENT.

F. MAST ARM. THE MAST ARM SHALL HAVE A HORIZONTAL LENGTH AS CALLED FOR ON THE PLANS.

A 1 1/2" THROUGH HOLE SHALL BE DRILLED IN THE BOTTOM OF THE ARM FOR EACH SIGNAL HEAD, OR OTHER REQUIRED FIXTURE. THE HOLE SHALL BE WELL REAMED AND FITTED WITH A WIRING GROMMET TO PREVENT THE CHAFING OF CABLES.

G. MAST ARM ATTACHMENT. ARM AND POLE MOUNTING PLATES SHALL BE PROVIDED. THE MAST ARM PLATE SHALL TELESCOPE THE MAST ARM AND BE CIRCUMFERENTIALLY WELDED INSIDE AND OUT. THE POLE PLATE SHALL BE ATTACHED TO THE SHAFT BY WELDED GUSSET PLATES TOP, BOTTOM AND SIDES. FOUR HIGH STRENGTH BOLTS SHALL BE FURNISHED TO ATTACH THE ARM TO THE SHAFT. SMOOTH HOLES SHALL BE PROVIDED IN THE TWO PLATES TO ALLOW THE SIGNAL CABLE TO GO FROM THE SHAFT TO THE ARM WITHOUT EXPOSURE TO THE OUTSIDE WEATHER.

H. IDENTIFICATION. THE MANUFACTURER SHALL PERMANENTLY MARK EACH MAST ARM AND POLE TO IDENTIFY THEM WITH THEIR CORRESPONDING TRAFFIC SIGNAL POLE SUMMARY ITEM NUMBER.

I. GALVANIZING. THE TRAFFIC SIGNAL POLE SHALL BE GALVANIZED IN ACCORDANCE TO ASTM A123. EACH COMPONENT MUST BE COMPLETELY COATED IN A SINGLE DIP. NO DOUBLE DIPPING WILL BE ALLOWED. ALL MISCELLANEOUS HARDWARE SHALL BE HOT DIPPED GALVANIZED ACCORDING TO ASTM A-153.

J. JOINT USE. WHEN A JOINT USE POLE IS SPECIFIED, THE LENGTH SHALL BE THIRTY-FIVE FEET (35'). IN ADDITION TO THE MAST ARM(S) IT SHALL BE DESIGNED TO SUPPORT A TRUSS TYPE LUMINAIRE ARMS WITH A FIVE FOOT (5') UPSWEEP (40 FOOT MOUNTING HEIGHT) WITH EACH ARM SUPPORTING A 70 POUND LUMINAIRE WITH 3.2 SQUARE FEET OF WIND LOAD AREA AND A WEIGHT OF 70 POUNDS. TWO SIMPLEX TYPE FITTINGS SHALL BE PROVIDED FOR EACH LUMINAIRE ARM. THE DISTANCE BETWEEN THE BOLT HOLES ON THE SIMPLEX FITTINGS SHALL BE 27 9/16". THE DIRECTIONAL ALIGNMENT OF THE LUMINAIRE ARM(S) SHALL BE AS SHOWN ON THE PLANS.

K. STREET NAME SIGNS. WHEN SPECIFIED ON THE PLANS, THE COMPLETE ASSEMBLY SHALL ALSO BE DESIGNED TO SUPPORT AN 18" X 60" RIGID MOUNTED 12 POUND REFLECTIVE STREET NAME SIGN MOUNTED BETWEEN THE TWO THRU SIGNALS, I.E. CENTER OF SIGN TO BE APPROXIMATELY 14' FROM THE END OF MAST ARM. THE SIGN WILL BE MOUNTED TO THE MAST ARM IN SUCH A MANNER THAT TORSION OR TORQUE FORCES ACTING ON THE MAST ARM SHALL BE HELD TO A MINIMUM.

10. STEEL SPAN WIRE POLES. THE FOLLOWING SPECIFICATION SHALL GOVERN THE DESIGN OF STEEL SPAN WIRE POLES AND APPURTENANCES UNLESS OTHERWISE SPECIFIED ON THE PLANS.

A. COMPLETE ASSEMBLY. THE COMPLETE ASSEMBLY SHALL INCLUDE, BUT NOT BE LIMITED TO:

(1) TAPERED STEEL SHAFT WITH BASE
(2) HANDHOLE WITH COVER
(3) CAP FOR TOP OF POLE
(4) SPAN WIRE CLAMPS
(5) STEEL WIRE ENTRANCE (WEATHERHEAD)
(6) ANCHOR BOLTS WITH NUTS AND WASHERS
(7) COVERS FOR EXPOSED ANCHOR BOLTS

B. DESIGN. THE TOTAL ASSEMBLY SHALL BE DESIGNED TO SUPPORT, BY MEANS OF A SPAN WIRE AND TETHER, THE VARIOUS EQUIPMENT SHOWN ON THE PLANS. THE POLE SHALL PROVIDE A MINIMUM CLEARANCE OF SEVENTEEN FEET (17') (AT MID-SPAN) FROM THE POLE BASE ELEVATION TO THE TETHER WIRE, WITH A SPAN WIRE SAG OF FIVE PERCENT.

CORNER POLES SHALL BE TAPERED AND HAVE A MINIMUM SECTION MODULUS AT THE BASE OF THE POLE 23.0 IN3. THE LENGTH OF THE CORNER POLE SHALL BE TWENTY-SIX FEET (26') FOR STANDARD INSTALLATIONS, AND THIRTY-FIVE FEET (35') FOR JOINT USE INSTALLATIONS. (SEE PARAGRAPH H BELOW FOR OTHER JOINT USE REQUIREMENTS.)

END POLES SHALL BE TAPERED AND HAVE A MINIMUM SECTION MODULUS AT THE BASE OF THE POLE OF 15.0 IN3. THE LENGTH OF THE END POLE SHALL BE TWENTY-SIX FEET (26').

THE MANUFACTURER SHALL PROVIDE AN INFORMATION SHEET SHOWING DESIGN DETAILS OF THE POLE, ANCHOR BOLTS, FLANGE CONSTRUCTION, ORIENTATION OF ANCHOR BOLTS, RECOMMENDATION FOR BACK RAKE, AND ANY OTHER PERTINENT INSTALLATION INSTRUCTIONS.

C. ANCHOR BOLTS. FOUR HIGH STRENGTH STEEL ANCHOR BOLTS, EACH FITTED WITH TWO NUTS AND TWO WASHERS SHALL BE FURNISHED WITH EACH POLE. EACH ANCHOR BOLT SHALL HAVE AN "L" BEND AT THE BOTTOM END AND SHALL BE THREAEED AT THE TOP END. ONLY THE TOP TEN INCHES IN THE THREADED ENDS OF THE ANCHOR BOLTS NEED BE GALVANIZED. THE MANUFACTURER SHALL PROPERLY MACHINE OR OTHERWISE INSURE THAT THE NUTS AND WASHERS SHALL READILY FIT THE ANCHOR BOLTS AFTER THE GALVANIZING PROCESS.

D. ANCHOR BASE. A ONE-PIECE STEEL ANCHOR BASE WITH A SIXTEEN INCH (16") BOLT CIRCLE, CONFORMING TO REQUIREMENTS OF ASTM A-36, OF ADEQUATE STRENGTH, SHAPE AND SIZE SHALL TELESCOPE AND BE WELDED TO THE LOWER END OF THE SHAFT USING TWO CONTINUOUS WELDS.

E. POLE SHAFT. THE SHAFTS SHALL BE FABRICATED FROM ASTM A-595 GRADE A STEEL.

TRAFFIC SIGNAL SPECIFICATIONS

DEPARTMENT OF OPERATIONS AND MAITENANCE 9/12
CITY OF WICHITA
TRAFFIC ENGINEERING DIVISION — WM.G.McKINLEY: TRAFFIC ENG.

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A HANDHOLE WITH A MINIMUM AREA OF 25 SQUARE INCHES SHALL BE WELDED INTO THE SHAFT A SHORT DISTANCE ABOVE THE BASE. A COVER SHALL BE PROVIDED FOR THE HANDHOLE.

POLE TOP CAPS SHALL BE PROVIDED AND SHALL BE SECURED IN PLACE WITH SET SCREWS OR OTHER SUITABLE FASTENERS.

A "J-HOOK" WIRE SUPPORT SHALL BE PROVIDED IN EACH POLE SHAFT.

PROVISION SHALL BE MADE FOR A GROUNDING ATTACHMENT.

SPAN WIRE CLAMPS SHALL BE PROVIDED TO ATTACH TWO SPAN WIRES MEETING AT 90 DEGREES AND TWO TETHER WIRES MEETING AT 90 DEGREES.

A STEEL, WIRE ENTRANCE (WEATHERHEAD) SHALL BE PROVIDED FOR EACH POLE.

F. IDENTIFICATION. THE MANUFACTURER SHALL PERMANENTLY MARK EACH POLE TO IDENTIFY IT WITH THE CORRESPONDING TRAFFIC SIGNAL POLE SUMMARY ITEM NUMBER.

G. FINISH. ALL MEMBERS AND HARDWARE SHALL BE HOT DIPPED GALVANIZED ACCORDING TO ASTM A-123 FOR SHAFTS, AND ACCORDING TO ASTM A-153 FOR HARDWARE.

H. JOINT USE. WHEN A JOINT USE POLE IS SPECIFIED, THE LENGTH SHALL BE THIRTY-FIVE FEET (35'). IN ADDITION TO THE SPAN WIRE, IT SHALL BE DESIGNED TO SUPPORT TRUSS TYPE LUMINAIRE ARMS WITH A FIVE FOOT (5') UPSWEEP (40 FOOT MOUNTING HEIGHT) WITH EACH ARM SUPPORTING A 70 POUND LUMINAIRE WITH 3.2 SQUARE FEET OF WIND LOAD AREA. TWO SIMPLEX TYPE FITTINGS SHALL BE PROVIDED FOR EACH LUMINIARE ARM. THE DISTANCE BETWEEN THE BOLT HOLES ON THE SIMPLEX FITTINGS SHALL BE 27 9/16". THE DIRECTIONAL ALIGNMENT OF THE LUMINAIRE ARM(S) SHALL BE AS SHOWN ON THE PLANS.

11. 8" AND 12" POLYCARBONATE TRAFFIC SIGNAL HEADS. THIS SPECIFICATION IS INTENDED TO PROVIDE THE MINIMUM ACCEPTABLE REQUIREMENTS FOR POLYCARBONATE TRAFFIC SIGNAL HEADS.

A. THE HOUSING SHALL BE SCREW-INJECTION MOLDED POLYCARBONATE RESIN AND SHALL BE OF SECTIONAL CONSTRUCTION TO PERMIT THE INSTALLATION OF ADDITIONAL SECTIONS FOR FUTURE NEEDS.

B. THE DOORS SHALL BE SCREW-INJECTION MOLDED POLYCARBONATE RESIN WHICH SHALL BE HINGED AT THE LEFT SIDE AND WITH SUBSTANTIAL SCREW OR WINGNUT TYPE FASTENERS OF STAINLESS STEEL AT THE RIGHT SIDE. CAM TYPE FASTENERS WILL NOT BE PERMITTED. THE VISOR SHALL BE OF POLYCARBONATE RESIN.

C. ALL HOUSINGS AND DOORS SHALL BE INTERCHANGEABLE.

D. THE LENSES SHALL BE GASKETED ~~WITH A NEOPRENE GASKET~~ TO EXCLUDE DUST AND MOISTURE. THE LENS, REFLECTOR, SOCKET AND GASKETING MUST MAKE A WATERPROOF ASSEMBLY.

E. THE HOUSING SHALL BE YELLOW WITH SIGNAL DOORS AND VISORS A FLAT BLACK. NO PAINTING SHALL BE PERMITTED. COLOR MUST BE MOLDED COMPLETELY THROUGH THE POLYCARBONATE MATERIAL AND SHALL NOT REQUIRE PAINTING IN FUTURE YEARS.

F. THE LENSES SHALL BE NOMINAL 8"-3/8" OR 12" DIAMETER; THE EXTERIOR OR CONVEX SURFACE SHALL BE SMOOTH. THE LENSES SHALL BE UNLETTERED RED, YELLOW, GREEN AND GREEN ARROW WHEN REQUIRED AND SHALL CONFORM TO THE SPECIFICATIONS OF THE INSTITUTE OF TRANSPORTATION ENGINEER'S ADJUSTABLE FACE VEHICULAR TRAFFIC CONTROL SIGNAL HEADS. LENSES MUST BE OF POLYCARBONATE MATERIAL.

G. "ALZAK" ALUMINUM REFLECTORS MEETING THE SPECIFICATIONS OF THE INSTITUTE OF TRANSPORTATION ENGINEER'S ADJUSTABLE FACE VEHICULAR TRAFFIC CONTROL SIGNAL HEADS SHALL BE FURNISHED. ONLY HIGH PURITY ALUMINUM SHALL BE USED. SCRATCHES OR DULLNESS OF REFLECTORS SHALL BE CAUSE FOR REJECTION. THE REFLECTOR SHALL EITHER BE GASKETED TO THE DOOR WITHOUT ADDITIONAL SPRINGS OR OTHER TYPE FASTENERS OR IT SHALL BE HINGED FROM THE SECTION HOUSING. SPRING OR PRESSURE TYPE FASTENERS THAT REQUIRE REMOVAL PRIOR TO CHANGING A BULB ARE NOT ACCEPTABLE.

H. THE LAMP RECEPTACLE SHALL CONFORM TO THE INSTITUTE OF TRANSPORTATION ENGINEERS (ITE) TECHNICAL REPORT NUMBER ONE AND TO THE SUPPLEMENT TO TECHNICAL REPORT NUMBER ONE.

I. THE OPTICAL UNIT SHALL PROVIDE FOR ANTI-SUN PHANTOM.

J. THERE SHALL BE A TERMINAL BLOCK IN EACH HEAD.

K. ALL SIGNALS SHALL BE ADJUSTABLE TYPE.

L. ALL GASKETS SHALL BE NEOPRENE OR RUBBER.

M. ALL SIGNALS SHALL BE SHIPPED ASSEMBLED WITH VISORS ATTACHED. VISORS SHALL BE CUT-AWAY DESIGN FOR EIGHT-INCH (8") SIGNAL HEADS AND TUNNEL DESIGN FOR TWELVE-INCH (12") SIGNAL HEADS.

N. THE FRONT OF EACH SIGNAL SECTION SHALL BE SQUARE IN APPEARANCE TO PROVIDE MAXIMUM TARGET VALUE".

O. EACH SIGNAL SECTION SHALL HAVE INTERNAL REINFORCING WEBS ADJACENT TO THE MOUNTING HOLES OR ALUMINUM SUPPORT PLATES TO PROVIDE ADDITIONAL STRENGTH AND RIGIDITY. THE SUPPORT PLATES SHALL BE APPROXIMATELY THE SAME SIZE AND SHAPE AS THE SIGNAL CROSS-SECTION AND SHALL BE PROVIDED AS DESCRIBED BELOW.

(1) FOR MOUNTING WITH AN ELEVATOR PLUMBIZER, ONE SUPPORT PLATE SHALL BE PROVIDED INSIDE THE RED SIGNAL SECTION AT THE BOTTOM AND ONE SUPPORT PLATE SHALL BE PROVIDED INSIDE THE YELLOW SIGNAL SECTION AT THE TOP. IF CALLED OUT ON THE BID REQUEST THE PLATES MAY BE REQUIRED BETWEEN THE YELLOW AND GREEN SECTIONS INSTEAD OF BETWEEN THE RED AND YELLOW SECTIONS.

(2) FOR MOUNTING WITH A RIGID FITTING AT THE TOP, ONE SUPPORT PLATE SHALL BE PROVIDED OUTSIDE THE RED SECTION ON TOP AND ONE SUPPORT PLATE SHALL BE PROVIDED INSIDE THE RED SECTION AT THE TOP.

(3) FOR RIGID MOUNTING ON A PEDESTAL, ONE SUPPORT PLATE SHALL BE PROVIDED OUTSIDE THE BOTTOM SECTION AT THE BOTTOM AND ONE SUPPORT PLATE SHALL BE PROVIDED INSIDE THE BOTTOM SECTION AT THE BOTTOM.

(4) FOR SPAN WIRE MOUNTING, TWO SUPPORT PLATES SHALL BE PROVIDED OUTSIDE, ONE ON TOP OF THE TOP SECTION AND ONE ON THE BOTTOM OF THE BOTTOM SECTION. ONE SUPPORT PLATE SHALL BE PROVIDED INSIDE THE TOP SECTION AT THE TOP AND ONE SUPPORT PLATE SHALL BE PROVIDED INSIDE THE BOTTOM SECTION AT THE BOTTOM.

P. SIGNAL END CLOSURES, SIMILAR TO EAGLE'S PINNACLE ASSEMBLY OR CROUSE HINDS' ROSSETA CAP AND LOCKNUT, SHALL BE PROVIDED AS FOLLOWS:

(1) NO END CLOSURES WILL BE REQUIRED FOR A SIGNAL HEAD MOUNTED WITH AN ASTRO-BRAC OR SUPER-BRAC ASSEMBLY.

(2) ONE END CLOSURE WILL BE REQUIRED FOR A SIGNAL HEAD MOUNTED WITH TOP-OF-POLE BRACKET.

(3) TWO END CLOSURES WILL BE REQUIRED FOR A SIGNAL HEAD MOUNTED WITH A TENNON ASSEMBLY.

Q. EACH BOX SHALL BE MARKED TO INDICATE THE TYPE OF MOUNTING THE SIGNAL IS INTENDED FOR AND THE BID ITEM NUMBER.

R. A BLANK SIGNAL SECTION SHALL CONSIST OF HOUDING, DOOR AND BOTH LENS AND DOOR GASKETS.

12. POLYCARBONATE PEDESTRIAN SIGNAL HEADS.

THESE SPECIFICATIONS ARE INTENDED TO PROVIDE THE MINIMUM ACCEPTABLE REQUIREMENTS FOR POLYCARBONATE PEDESTRIAN SIGNAL HEADS.

A. A PEDESTRIAN SIGNAL SHALL CONSIST OF TWO IDENTICAL SECTIONS, ONE TO INDICATE "WALK" AND THE OTHER TO INDICATE "DON'T WALK" WHEN ILLUMINATED BY A SINGLE STANDARD INCANDESCENT TRAFFIC SIGNAL LAMP CONTAINED IN EACH SECTION. THE DESIGN OF THE SIGNAL SHALL BE SUCH THAT THE TWO SECTIONS CAN BE HELD FIRMLY TOGETHER IN A MANNER THAT THEY CAN BE READILY DISASSEMBLED AND REASSEMBLED FOR REPAIR AND REVISION.

B. THE HOUSING SHALL BE SCREW INJECTION MOLDED POLYCARBONATE RESIN AND SHALL BE OF SECTIONAL CONSTRUCTION. THE TOP AND BOTTOM OF EACH SECTION SHALL HAVE SERRATIONS MOLDED IN TO FACILITATE ADJUSTMENT AND ATTACHING TO OTHER SECTIONS.

C. THE DOORS SHALL BE SCREW INJECTED MOLDED POLYCARBONATE RESIN AND SHALL BE HINGED AT THE LEFT SIDE WITH SUBSTANTIAL SCREW TYPE FASTENERS OF STAINLESS STEEL AT THE RIGHT SIDE. CAM TYPE FASTENERS WILL NOT BE PERMITTED. THE VISOR SHALL BE OF POLYCARBONATE RESIN.

D. ALL HOUSINGS AND DOORS SHALL BE INTERCHANGEABLE.

E. THE HOUSINGS SHALL BE YELLOW WITH SIGNAL DOORS AND VISORS A FLAT BLACK. NO PAINTING SHALL BE PERMITTED. COLOR SHALL BE MOLDED COMPLETELY THROUGH THE POLYCARBONATE MATERIAL TO ELIMINATE ANY FUTURE PAINTING.

F. EACH LENS SHALL BE FLAT WITH A SMOOTH OUTSIDE SURFACE. WHEN NOT ILLUMINATED, THE LETTERING ON EACH LENS SHALL BE WELL OBSCURED. THE LETTERING SHALL BE IN A STRAIGHT LINE WITH A MINIMUM HEIGHT OF 3" AND A 3/8" WIDE STROKE FOR 9" LENSES AND 4 1/2" AND A 7/16" WIDE STROKE FOR 12" LENSES. LETTERING STYLE SHALL CONFORM TO IN- STITUTE OF TRANSPORTATION ENGINEERS (ITE) ADJUSTABLE FACE PEDESTRIAN SIGNAL HEAD STANDARD.

G. THE LENSES SHALL BE LETTERED "DON'T WALK" AND "WALK". "DON'T WALK" LENSES SHALL BE PORTLAND ORANGE IN COLOR AND WALK LENSES SHALL BE LUNAR WHITE IN COLOR. LENSES MUST BE OF POLYCARBONATE MATERIAL AND SHALL CONFORM TO ITE ADJUSTABLE FACE PEDESTRIAN SIGNAL HEAD STANDARD.

H. THE LENSES SHALL BE GASKETED ~~WITH A NEOPRENE GASKET~~ TO EXCLUDE DUST AND MOISTURE. THE LENS, REFLECTOR, SOCKET AND GASKETING MUST MAKE A WATERPROOF ASSEMBLY.

I. ALZAK ALUMINUM REFLECTORS MEETING THE SPECIFICATIONS OF THE ITE SHALL BE FURNISHED. SCRATCHES OR DULLNESS OF THE REFLECTORS SHALL BE CAUSE FOR REJECTION.

J. THE LAMP RECEPTACLE SHALL CONFORM TO ITE ADJUSTABLE FACE PEDESTRIAN SIGNAL HEAD STANDARD WITH THE PROPER SIZE FOCAL LENGTH BULB.

K. EACH SECTION SHALL HAVE A VISOR (MINIMUM 8") WHICH SHALL BE SQUARE IN APPEARANCE.

L. ALL SIGNALS SHALL BE ADJUSTABLE AND SHALL CONTAIN A TERMINAL BLOCK IN EACH HEAD.

M. ALL GASKETS SHALL BE NEOPRENE *OR RUBBER.*

N. ALL SIGNALS SHALL BE SHIPPED ASSEMBLED WITH VISORS ATTACHED.

O. THE OPTICAL UNIT SHALL PROVIDE FOR ANTI-SUN PHANTOM WITH THE LENSES HAVING BLACK OPAQUE BACKGROUNDS.

P. IF AVAILABLE, THE MANUFACTURER SHALL SUPPLY EXTRA ALUMINUM SUPPORT PLATES IN THE TOP OF THE TOP SECTION WHEN THE BID REQUEST CALLS FOR NO BRACKETS AND IN THE BOTTOM OF THE BOTTOM SECTION WHEN THE BID REQUEST CALLS FOR A ONE-WAY POST TOP MOUNT.

13. BRACKETS AND MOUNTING ATTACHMENTS. BRACKETS, CLAMPS, ETC., SHALL BE FURNISHED IN ACCORDANCE WITH THE DETAILS ON THE PLANS AND/OR ITEMS LISTED IN THE BILL OF MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE TO ADVISE THE SUPPLIER OF THE EXACT INTENT OF THE PLANS WITH REGARD TO PROPOSED SIGNAL MOUNTING COMBINATIONS AND THEIR CORRESPONDING SIGNAL ORIENTATIONS AND SIGNAL HEAD TYPES AS WELL AS THE REQUIREMENTS FOR OTHER APPURTENANCES SUCH AS CABINETS OR SIGNS. IN THIS MANNER, IT IS INTENDED THAT ALL FITTINGS, SPACERS, BOLTS, CLAMPS, ETC., SHALL BE FURNISHED IN SUFFICIENT QUANTITY TO EFFECT COMPLETE MOUNTING OF THE SIGNAL HEAD(S) OR OTHER APPURTENANCES WHETHER OR NOT EACH INDIVIDUAL ELEMENT IS DELINEATED OR ITEMIZED ON THE PLANS.

TRAFFIC SIGNAL SPECIFICATIONS

DEPARTMENT OF OPERATIONS AND MAITENANCE 10/12
CITY OF WICHITA
TRAFFIC ENGINEERING DIVISION W.M.G.McKINLEY: TRAFFIC ENG.

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A. BRACKET ASSEMBLIES SHALL CONFORM TO THE FOLLOWING PROVISIONS UNLESS OTHERWISE NOTED ON THE PLANS.

(1) CONSTRUCTION SHALL BE FROM MALLEABLE IRON.

(2) PROVISIONS SHALL BE MADE FOR ACCEPTING AND DIRECTING WIRE FEEDS COMING FROM INSIDE THE SIGNAL SUPPORT POLE.

(3) IRON BRACKETS SHALL BE SHOP PAINTED FEDERAL YELLOW.

B. POLE MOUNTED FITTINGS SHALL BE EITHER CAST ALUMINUM OR CAST IRON.

C. BANDING MATERIAL SHALL BE STAINLESS STEEL OF A WIDTH AS RECOMMENDED BY THE SUPPLIER (GENERALLY 3/4" MINIMUM) WITH STAINLESS STEEL BUCKLES.

14. RIGID GALVANIZED STEEL CONDUIT. ALL CONDUIT SHALL BE HOT DIPPED GALVANIZED RIGID STEEL CONDUIT, UL APPROVED, AND MEET FEDERAL SPECIFICATIONS WW. C-581-D AND/OR AMERICAN STANDARD #080-1.

SECTION 2 - TRAFFIC SIGNAL EQUIPMENT

01. EACH TYPE 170 TRAFFIC SIGNAL CONTROLLER SYSTEM SHALL MEET THE APPLICABLE SPECIFICATIONS DETAILED IN FHWA-IP-78-16 "TYPE 170 TRAFFIC SIGNAL CONTROLLER SYSTEM - HARDWARE SPECIFICATIONS" AS WELL AS THE ADDITIONAL REQUIREMENTS NOTED BELOW:

A. CONTROLLER UNIT
THE MODEL 170 CONTROLLER UNIT SHALL CONTAIN A SINGLE MPU WITH AT LEAST 2K OF RAM MEMORY ON A SEPARATE BOARD APART FROM THE INPUT/OUTPUT LOGIC BOARD.

THE MODEL 170 CONTROLLER SHALL INCLUDE A MODEL 412 SYSTEM MEMORY MODULE OF SAME MANUFACTURE AS SPECIFIED IN FHWA-IP-78-16 (NOVEMBER, 1978, ADDENDUM) IN LIEU OF THE TRAFFIC PROM MODULE. THE 412 SYSTEM MEMORY MODULE SHALL INCLUDE E2 PROM-(2816).

B. CONFLICT MONITOR
THE MODEL 210 CONFLICT MONITOR(S) SUPPLIED SHALL MEET REQUIREMENTS OUTLINED IN CHAPTER 3 OF THE TRAFFIC SIGNAL CONTROL HARDWARE SPECIFICATIONS DETAILED IN FHWA-IP-78-16 PUBLISHED BY THE FEDERAL ADMINISTRATION AND DATED DECEMBER, 1978, AND THE FOLLOWING REQUIREMENTS:

1. ANY DARK SIGNAL HEAD (THAT IS, LOSS OF SIGNAL OUTPUT TO FIELD TERMINALS) SHALL CAUSE THE MONITOR TO TRIP.

2. ANY YELLOW TIME LESS THAN 2.8 SECONDS SHALL CAUSE THE MONITOR TO TRIP

3. THE GREEN, YELLOW AND RED INDICATIONS FOR EACH PHASE SHALL BE BROUGHT INTO THE MONITOR INDIVIDUALLY AND SHALL BE MONITORED SEPARATELY WITH RESPECT TO A LOSS OF SIGNAL ON ANY OF THE THREE IN-PUTS PER CHANNEL.

4. THE MONITOR SHALL HAVE THE REQUIRED CIRCUITRY TO ALLOW THE EARLY DETECTION OF A CONFLICT CAUSED BY A GREEN OR YELLOW SIGNAL "HANG UP" (THAT IS, ANY GREEN OR YELLOW OUTPUT WHICH SHALL REMAIN ON WHEN THE CONTROLLER HAS TRANSFERRED TO A YELLOW OR ALL RED OUTPUT RESPECTIVELY) BY STARTING THE FAULT TIMERS AS SOON AS YELLOW APPEARS WITH THE CORRESPONDING GREEN STILL ENERGIZED. THE MONITOR SHALL NOT WAIT UNTIL A CONFLICTING GREEN IS DISPLAYED TO TIME THE CONFLICT. THIS SHALL PRECLUDE THE PRESENTATION OF A CONFLICTING SIGNAL DISPLAY AT THE INTERSECTION.

5. DURING THE "ALL RED" CLEARANCE PERIOD (IF USED), THE MONITOR SHALL CHECK ALL INPUTS FOR FAULTY SIGNAL DISPLAY AND SHALL REACT TO THESE FAULTY INDICATIONS DURING THE ALL RED CLEARANCE PERIOD.

SINCE DURING THIS PERIOD THE ONLY INPUTS THAT SHOULD BE ACTIVE WOULD BE THE REDS, THE MONITOR SHALL DETECT ANY FAULTS SUCH AS RED/GREEN, RED/YELLOW, GREEN/YELLOW AND GREEN/RED/YELLOW.

6. THE MONITOR SHALL BE CAPABLE OF MONITORING FOR INCORRECT SIGNALS APPLIED AT THE FIELD TERMINALS OF EACH VEHICULAR MOVEMENT (GREEN, YELLOW, RED). SHOULD A VOLTAGE BE PRESENT ON MORE THAN ONE, OR NONE, OF THE INPUTS (GREEN, YELLOW, RED) OF A CHANNEL, THE UNIT SHALL BEGIN TIMING THE DURATION OF THIS CONDITION. IF THIS CONDITION EXISTS FOR LESS THAN 700 MILLISECONDS, THE UNIT SHALL NOT TRIGGER. IF THIS CONDITION EXISTS FOR 700 MILLISECONDS OR MORE, BUT LESS THAN 1,000 MILLISECONDS, THE UNIT MAY OR MAY NOT TRIGGER.

7. WHEN THE UNIT TRIGGERS, IT SHALL CAUSE THE OUTPUT RELAY CONTACTS TO TRANSFER. THESE CONTACTS SHALL REMAIN IN THIS STATE UNTIL THE UNIT IS RESET BY THE ACTIVATION OF THE PANEL CONTROL, OR THE ACTIVATION OF THE EXTERNAL RESET INPUT. POWER INTERRUPTION SHALL NOT RESET THE CONFLICT MONITOR WHEN IT HAS BEEN TRIGGERED BY DETECTION OF A FAULTY LOAD SWITCH OUTPUT.

8. THE MINIMUM INDICATORS SHALL BE AS FOLLOWS:

A. POWER - SHALL BE ILLUMINATED WHEN THE 24VDC INPUT FROM THE CONTROLLER IS PRESENT AND AC+ IS APPLIED TO THE MONITOR.

B. WATCH DOG ERROR - SHALL ILLUMINATE WHEN THE MONITOR DETECTS A WATCH DOG ERROR.

C. CONFLICT - SHALL ILLUMINATE WHEN A CONFLICT HAS BEEN DETECTED BY THE MONITOR.

D. RED FAILURE - SHALL ILLUMINATE WHEN A RED FAILURE HAS BEEN DETECTED BY THE MONITOR.

E. SWITCH FAIL - SHALL ILLUMINATE WHEN A FAULTY LOAD SWITCH HAS BEEN DETECTED BY THE MONITOR.

F. PCA SHALL ILLUMINATE WHEN THE PROGRAM BOARD IF NOT INSTALLED OR NOT INSTALLED PROPERLY.

G. PIAF - SHALL ILLUMINATE WHEN THE UNIT HAS DETECTED A FAILURE AND THEN EXPERIENCES A POWER INTERRUPTION.

H. THE MONITOR SHALL INCLUDE SIGNAL STATUS INDICATORS. THESE INDICATIONS (ONE PER CHANNEL) SHALL ILLUMINATE WHEN A PROCEED SIGNAL IS PRESENT ON THE CORRESPONDING CHANNEL DURING NORMAL OPERATION. IF THE UNIT TRIPS DUE TO A CONFLICT, THE SIGNAL STATUS SHALL LOCK UP, DISPLAYING THE STATUS OF EACH CHANNEL AT THE TIME THE CONFLICT OCCURRED. SHOULD THE MONITOR TRIP DUE TO THE ABSENCE OF RED OR A FAULTY SWITCH OUTPUT, THE SIGNAL STATUS INDICATORS SHALL DISPLAY THE CHANNEL (CHANNELS) WHICH IS (ARE) AT FAULT.

I. IF THE MONITOR DETECTS A LOAD SWITCH FAULT CONDITION, THE SWITCH FAILURE INDICATOR SHALL BE ILLUMINATED AND THE SIGNAL STATUS INDICATORS WILL DISPLAY THE EXACT CHANNEL OF THE LOAD SWITCH THAT FAILED.

J. THE RED INPUTS SHALL BE BROUGHT INTO THE MONITOR VIA A FRONT PANEL CONNECTOR.

K. THE RED ENABLE SHALL BE BROUGHT INTO THE MONITOR VIA THE SAME FRONT PANEL CONNECTOR AS THE RED INPUTS.

L. A RED INTERFACE ADAPTER SHALL BE WIRED IN AND TESTED.

M. CONFLICT MONITOR TO BE CAPABLE OF MONITORING FOUR (4) RED, YELLOW AND GREEN OUTPUTS FROM THE MODEL 420 AUXILIARY OUTPUT FILE.

C. DETECTORS

THE MODEL 222 TWO-CHANNEL LOOP DETECTOR AS SPECIFIED IN CHAPTER 4 FHWA-IP-78-16 SHALL COMPLY WITH ALL PERFORMANCE REQUIREMENTS WHEN CONNECTED TO AN INDUCTANCE OF FROM 20 - 2000 MICROHENRIES AND SHALL PROVIDE FOR A "FAILSAFE" CONTINUOUS OUTPUT IN RESPONSE TO AN OPEN LOOP OR OPEN LEAD-IN WIRE. EACH DETECTOR SHALL BE PROVIDED WITH A TEST SWITCH WHICH SHALL INDICATE A PREVIOUS FAULT VIA THE FRONT PANEL INDICATOR.

D. CONTROLLER CABINET

THE MODEL 332 CABINET SHALL BE UNPAINTED NATURAL ALUMINUM. THE OUTPUT FILE MUST BE CAPABLE OF FLASHING ALL 8 PHASES RED OR YELLOW. THE THREE-POINT LOCKING MECHANISM SHALL BE FABRICATED SO THAT IT MAY BE ACTUATED BY ROTATING A REMOVABLE 5/8 INCH HEX KEY. THE HEX SOCKET AND LOCKING CAM SHALL ROTATE ON A 3/4 INCH MINIMUM DIAMETER SHAFT. THE SOCKET AND SHAFT SHALL BE FIELD-REPLACEABLE WITH COMMON TOOLS. THE SOCKET HEAD SHALL BE PROTECTED FROM BEING ROTATED WITH A PIPE WRENCH OR SIMILAR TOOL. ONE HEX WRENCH SHALL BE PROVIDED WITH EACH CABINET.
FIELD WIRING SHALL BE CONNECTED DIRECTLY TO INPUT FILES.

THE LIFTING EYES SHALL BE REMOVABLE. INTERCHANGEABILITY OF THE ISOLATION RELAY AND LOGIC RELAY SHALL NOT BE POSSIBLE. ANCHOR BOLTS TO BE PROVIDED.

02. TRAFFIC SIGNAL LAMPS. LAMPS FOR VEHICULAR AND PEDESTRIAN SIGNALS SHALL MEET THE FOLLOWING REQUIREMENTS:

A. 8" AND 9" SIGNALS

A NOMINAL 67 WATT, 120 VOLT, A21 CLEAR TRAFFIC SIGNAL LAMP OF 8,000 HOUR LIFE RATING GUARANTEED BY THE MANUFACTURER, TO BE USED IN ALL 8" VEHICULAR AND 9" PEDESTRIAN INDICATIONS.

B. 12" SIGNALS
A NOMINAL 150 WATT, 120 VOLT, A21 CLEAR TRAFFIC SIGNAL LAMP OF 8,000 HOUR LIFE RATING GUARANTEED BY THE MANUFACTURER, TO BE USED IN ALL 12" VEHICULAR AND PEDESTRIAN INDICATIONS.

C. CANDLEPOWER

ALL TRAFFIC SIGNAL LAMPS MUST MEET BEAM CANDLEPOWER SPECIFICATION OF ITE-1110(1970).

03. BACK PLATES. WHERE SHOWN ON THE PLANS, 5" BACK PLATES SHALL BE FURNISHED AND ATTACHED TO THE SIGNAL FACES TO PROVIDE A DARK BACKGROUND FOR SIGNAL INDICATIONS. BACK PLATES SHALL BE CONSTRUCTED OF ALUMINUM ALLOY SHEET OR DURABLE PLASTIC CAPABLE OF WITHSTANDING A 100 M.P.H. WIND.

WHERE A BACK PLATE CONSISTS OF TWO OR MORE SECTIONS, THE SECTIONS SHALL BE FASTENED WITH RIVETS, STAINLESS STEEL OR ALUMINUM BOLTS, PEENED AFTER ASSEMBLY TO PREVENT LOOSENING.

04. STREET NAME SIGNS

A. GENERAL. IT IS THE PURPOSE AND INTENT OF THIS SPECIFICATION TO DESCRIBE A REFLECTORIZED STREET NAME SIGN. THE SIGN IS SPECIFICALLY DESIGNED TO IDENTIFY A STREET AT AN INTERSECTION OR TO INFORM A DRIVER OF THE IDENTITY OF A STREET HE IS APPROACHING BEFORE HE REACHES THE INTERSECTION. ALL MATERIALS USED SHALL BE NEW AND OF GOOD QUALITY.

B. PANELS. THE SIGN PANELS SHALL BE ABLE TO WITHSTAND A LOAD OF 40 POUNDS PER SQUARE FOOT WIND PRESSURE AND 30 POUNDS PER SQUARE FOOT SUCK OUT PRESSURE AND SHALL BE SHATTERPROOF.

THE GREEN COLOR SHALL CONFORM TO FEDERAL COLOR STANDARD 595A, COLOR NO. 14109. LIGHT TRANSMISSION FACTOR OF THE SIGN PANEL SHALL BE 10 TO 1 OR GREATER, LETTER TO BACKGROUND RATIO BRIGHTNESS.

TRAFFIC SIGNAL SPECIFICATIONS

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DEPARTMENT OF OPERATIONS AND MAITENANCE
CITY OF WICHITA
TRAFFIC ENGINEERING DIVISION — WM.C.McKINLEY: TRAFFIC ENG.

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THE LEGEND SHALL BE 8" UPPER CASE, 8" LOWER CASE WITH A SERIES E MODIFIED COPY AS PER FEDERAL HIGHWAY ADMINISTRATION. SERIES D OR E COPY SHALL BE USED WHERE MESSAGE LENGTH PERMITS.

BEFORE FINAL FABRICATION AND SHIPMENT, THE MANUFACTURER OR SUPPLIER SHALL PROVIDE THE ENGINEER WITH A DRAWING OF EACH SIGN SHOWING THE EXACT STREET NAME LETTERING TO BE PLACED ON THE SIGN.

05. VEHICLE DETECTOR LOOP WIRE SEALANT

A. THE SAW SLOT FILLER AND ENCAPSULANT SHALL BE A ONE-PART ELASTOMERIC COMPOUND REQUIRING NO MIXING, MEASURING OR APPLICATION OF HEAT PRIOR TO OR DURING ITS INSTALLATION AND INTENDED FOR SEALING AND PROTECTING VEHICLE DETECTOR LOOP WIRES INSTALLED IN SAWCUTS 1/4" TO 3/8" WIDE AND 2 1/2" TO 3 1/2" DEEP.

B. THE ENCAPSULANT IS INTENDED TO PROVIDE COMPRESSIVE YEILD STRENGTH TO WITHSTAND NORMAL VEHICULAR TRAFFIC AS WELL AS SUFFICIENT FLEXIBILITY TO WITHSTAND NORMAL MOVEMENT IN ASPHALTIC AND CONCRETE PAVEMENTS, WHILE PROTECTING THE LOOP WIRE FROM MOISTURE PENETRATION,FRACTURE AND SHEAR.

C. THE ENCAPSULANT SHALL BE DESIGNED FOR ROADWAY INSTALLATION WHEN SURFACE TEMPERATURE IS BETWEEN 40 AND 140 DEGREES F AND ENABLE VEHICULAR TRAFFIC TO PASS OVER THE SAWCUT IMMEDIATELY AFTER INSTALLATION WITHOUT TRACKING OR STRINGING OF THE MATERIAL. THE ENCAPSULANT SHALL FORM A SURFACE SKIN ALLOWING EXPOSURE TO VEHICULAR TRAFFIC WITHIN 30 MINUTES AT 75xF AND COMPLETELY CURE TO A TOUGH, RUBBER-LIKE CONSISTENCY IN TWO (2) TO SEVEN (7) DAYS AFTER INSTALLATION.

D. CURED ENCAPSULANT SHALL EXHIBIT RESISTANCE TO EFFECTS OF WEATHER, VEHICULAR ABRASION, MOTOR OILS, GASOLINE, ANTIFREEZE SOLUTION, BRAKE FLUID, DEICING CHEMICALS AND SALT NORMALLY ENCOUNTERED, IN SUCH A MANNER THAT THE PERFORMANCE OF THE VEHICLE DETECTOR LOOP WIRE IS NOT ADVERSELY AFFECTED.

E. FILLING OF THE SAWCUT SHALL BE IN ACCORDANCE WITH THE DIRECTIONS OF THE MANUFACTURER.

06. NUTS AND BOLTS. WHEN USED IN MAST ARM ATTACHMENTS TO THE POLE OR IN ANCHORING THE POLE TO THE CONCRETE BASE, THE NUTS AND BOLTS SHALL BE RATED HIGH STRENGTH AND CONFORM TO SECTION 1613, TYPE II OF THE 1980 KDOT STANDARD SPECIFICATIONS. AN ANTI-SIEZE COMPOUND SHALL BE USED ON ALL BOLTS, SCREWS, ETC.

07. SHIELDED DETECTOR LEAD IN ELECTRICAL CABLE. THE CONDUCTOR AND DRAIN WIRES, SHALL BE TINNED COPPER WIRES. THE CONDUCTORS SHALL BE SHIELDED BY A LAYER OF ALUMINUM BONDED TO POLYESTER FILM. ALL WIRES SHALL HAVE POLYETHYLENE INSULATION AND A JACKET OF VINYL.

IN ADDITION, THE CABLE SHALL MEET THE FOLLOWING REQUIREMENTS:

18 AWG (STRANDED) DRAIN WIRE

16 (19 x 29) AWG (STRANDED)

025 INSULATION THICKNESS (1 INCH)

030 JACKET THICKNESS (1 INCH)

274 NOM. O.D. (1 INCH)

BLACK & CLEAR CONDUCTOR COLOR CODE

100 PERCENT SHIELD COVERAGE

24 NOM * CAP (PF/FT)

47 NOM ** CAP (PF/FT)

600 SUGGESTED WORKING VOLTAGE

*CAPACITANCE BETWEEN CONDUCTORS

**CAPACITANCE BETWEEN ONE CONDUCTOR AND THE OTHER CONDUCTOR CONNECTED TO SHIELD.

08. LOOP DETECTORS

A. WIRE. THE LOOP WIRE SHALL BE 600 VOLT STRANDED COPPER, NO. 14AWG, TYPE THHN OR THWN WITH UL APPROVAL.

B. INSTALLATION. THE FIELD LOOP CONDUCTOR INSTALLED IN THE PAVEMENT SHALL RUN CONTINUOUSLY FROM THE TERMINATING SERVICE BOX, JUNCTION BOX, OR BASE WITH NO SPLICES PERMITTED. THE FIELD LOOP CONDUCTORS SHALL BE SPLICED TO THE LEAD-IN CABLE AND THE LEAD-IN CABLE SHALL RUN CONTINUOUSLY FROM THE TERMINATING SERVICE BOX, JUNCTION BOX, OR BASE TO THE DETECTOR SENSING UNIT EXCEPT ON MULTIPLE LOOP INSTALLATIONS WHERE ADDITIONAL LOOP CONDUCTORS MAY BE SPLICED TO THE LEAD-IN CABLE AS DIRECTED BY THE ENGINEER.

ALL LENGTHS OF LOOP WIRES THAT ARE NOT IMBEDDED IN THE PAVEMENT SHALL BE TWISTED WITH AT LEAST TWO (2) TURNS PER FOOT, INCLUDING LENGTHS IN CONDUITS AND HANDHOLES.

THE ELECTRICAL SPLICE BETWEEN THE LOOP LEAD-IN CABLE TO THE CONTROLLER AND THE LOOP WIRE SHALL BE MADE BY THE FOLLOWING METHOD:

(1) REMOVE ALL LEAD-IN CABLE COVERINGS LEAVING FOUR (4) INCHES OF INSULATED WIRE EXPOSED.

(2) REMOVE THE INSULATION FROM EACH CONDUCTOR OF A PAIR OF LEAD-IN CABLE CONDUCTORS AND SCRAPE BOTH COPPER CONDUCTORS WITH KNIFE UNTIL BRIGHT.

(3) REMOVE THE INSULATION FROM THE LOOP WIRES AND SCRAPE BOTH COPPER CONDUCTORS WITH KNIFE UNTIL BRIGHT.

(4) CONDUCTORS SHALL BE JOINED BY USING A #14 BUTT SPLICE. THE TWO SPLICES SHALL BE STAGGERED TO PROVIDE ADEQUATE INSULATION. EACH SPLICE SHALL BE INSULATED WITH LAYERS OF THERMOPLASTIC OR NEOPRENE INSULATION ELECTRICAL TAPE BEARING THE LABEL OF THE UNDERWRITERS LABORATORIES, INC., APPLIED TO A THICKNESS EQUAL TO AND WELL LOOPED OVER THE ORIGINAL INSULATION. THE TWO SPLICES SHALL THEN BE OVER WRAPPED WITH LAYERS OF THERMOPLASTIC OR NEOPRENE INSULATION AS ABOVE AND THEN COATED THOROUGHLY WITH A WATER PROOF ELECTRICAL COATING.

THE LOCATION OF EACH LOOP SHALL BE MARKED ON THE PAVEMENT WITH CRAYON OR SPRAY PAINT. THE CONTRACTOR SHALL OBTAIN THE APPROVAL OF THE ENGINEER PRIOR TO CUTTING THE SAW SLOTS.

THE SAW SHALL BE EQUIPPED WITH A DEPTH GAUGE AND HORIZONTAL GUIDE TO ASSURE PROPER DEPTH AND ALIGNMENT OF THE SLOT. THE BLADE USED FOR THE SAW CUT SHALL PROVIDE A CLEAN, STRAIGHT, WELL DEFINED ONE FOURTH (1/4) INCH WIDE SAW CUT WITHOUT DAMAGE TO ADJACENT AREAS. THE DEPTH OF THE SAW CUT SHALL BE 2 1/2 - 3 1/2INCHES DEEP. WHERE THE LOOP CHANGES DIRECTION, THE SAW CUTS SHALL BE OVERLAPPED TO PROVIDE FULL DEPTH AT ALL CORNERS. RIGHT ANGLE OR CORNERS LESS THAN 90x SHALL NOT BE USED.

BEFORE INSTALLING THE LOOP WIRE, THE SAW CUTS SHALL BE CHECKED FOR THE PRESENCE OF JAGGED EDGES OR PROTRUSIONS. SHOULD THESE EXIST, THEY MUST BE REMOVED. THE SLOTS MUST BE CLEANED AND DRIED TO REMOVE CUTTING DUST, GRIT, OIL, MOISTURE OR OTHER CONTAMINENTS. CLEANING SHALL BE ACHIEVED BY FLUSHING CLEAN WITH A STREAM OF WATER, AND FOLLOWING THIS, THE SLOTS SHOULD BE CLEARED OF WATER AND DRIED USING OIL-FREE COMPRESSED AIR.

LOOP DETECTOR CONDUCTOR SHALL BE INSTALLED USING A ONE-EIGHTH (1/8) INCH TO THREE-SIXTEENTH (3/16) INCH THICK WOOD PADDLE. IF THE WIRE DOES NOT LAY CLOSE TO THE BOTTOM OF THE SAW CUT, IT SHALL BE HELD DOWN BY MEANS OF A MATERIAL SUCH AS TAPE OR DOUBLED-OVER PIECES OF PLASTIC.

EACH LOOP SHALL BE COILED CLOCKWISE (OR PER MANUFACTURERS RECOMMENDED PRACTICE) AND THE BEGINNING CONDUCTOR BANDED IN THE TERMINATING HANDHOLE OR BASE WITH A SYMBOL "S" TO DENOTE START OF CONDUCTOR. EACH LOOP SHALL BE FURTHER IDENTIFIED BY PHASE OR FUNCTION AS SHOWN ON THE PROJECT PLANS,WITH DURABLE TAGS, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC SIGNAL SPECIFICATIONS 12/12

DEPARTMENT OF OPERATIONS AND MAITENANCE
CITY OF WICHITA
TRAFFIC ENGINEERINC DIVISION WM.G.McKINLEY: TRAFFIC ENG.

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